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John M. Maisch M.D.

THE F. GUTEKUNST CO., PHILA

PROCEEDINGS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

AT THE

FORTY-FIRST ANNUAL MEETING,

HELD AT

CHICAGO, ILL., AUGUST, 1893,

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

PHILADELPHIA:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1893.

PROF. JOHN MICHAEL MAISCH, PH.M.

PROF. JOHN MICHAEL MAISCH was born in Germany, at Hanau on the Main, on the 30th of January, 1831, his father being Conrad Maisch, a merchant of moderate means. At an early age he attended a private school, and subsequently the city free school; by the time he reached the age of ten he had passed through four classes of this institution, and was therefore admitted into the middle public school.

In a short time he attracted the attention of his instructor to such an extent, that he became a frequent visitor to Pastor Wĕrishoffer's residence, for the purpose of correcting the lessons of the lower classes, and for this labor he received instruction in the rudiments of French. Between the ages of twelve and thirteen years he left this school, with the object of learning the jewelry business, as recommended by his parents, Hanau being greatly renowned for the skillful work of her artisans in this trade. His instructions here lasted for a very brief period, as he was still of the age when he was compelled by law to attend school, and his parents were unable to obtain an official dismissal. School Inspector Roeder, on the recommendation of his Pastor Wĕrishoffer, however, obtained for him free instruction in the class of the Realschule, into which he was admitted on probation. And in this school he also proved an apt scholar, and drew the attention of his teacher, Pastor Beinhauer. Inspector Roeder having obtained permission to open an Oberrealschule, Maisch was taken into the third division. Theobald, the teacher of Botany and Zoölogy, became interested in the young student, and revealed to him the wonders of the microscope. Under the same direction, Maisch attended botanical and mineralogical excursions in the vicinity of Hanau. These opportunities awakened in the young man a decided liking for the natural sciences, and in great part shaped the course of his after life.

Beinhauer was orthodox, and while Roeder was an ordained preacher, his passion for the natural sciences led him more and more into different channels, until he taught only these branches. Having the companionship of two such men, the idea of the union of religion and science had something fascinating for Maisch, which was further encouraged by the promise of his instructors to prepare him for the university, and by the desire of his mother, to have her son John a minister of the Gospel.

The school which young John was attending did not have in its curriculum the necessary branches to permit his matriculation at a university, and this compelled him to acquire knowledge from an outside source, especially in the dead languages. Of much greater importance was the beginning of the instruction in chemistry, under Dr. Bromies, for he took great interest in chemical experiments, and was known among his companions as a very earnest student. Bromies encouraged all of his students to begin original researches, and he permitted young Maisch to assist him in the continuation of his work on the fatty acids and resins. These opportunities led Maisch finally to give up the intention of studying theology, and in the future to study the natural sciences exclusively; but it seemed as if fate had ordained otherwise.

It was the intention of his teachers to prepare him so that he would be admitted into one of the upper classes of the Gymnasium; this demanded from him extraordinary exertion, which was too much for his already weakened constitution, and at the close of the school year we find him confined to his bed by sickness. On his recovery, and after a conference with his physician, his teachers advised him to relinquish the idea of study-

ing at a university, as they considered it beyond his powers of endurance. With a sad heart he followed their advice, and intended to take up the study of pharmacy; but here similar obstacles were encountered, the improbability of his obtaining the concession of an apothecary being the principal one. He then entered the service of Hesse, and about this time he joined the Turners of Hanau, and with them made the excursions which have become memorable in the history of the valley of the Main. The excursions were not taken so much to extend the use or show the value of gymnastics, as to spread the sentiments of revolution, so prevalent at that time. Maisch assisted in this with all his powers, and in consequence he left the service of the State, as he thought it was not right to be in its service in the day-time and working against it at night. In 1849 he accompanied the Turners on an excursion to Baden, and was captured at Sinsheim, but with the assistance of some comrades he escaped from prison and returned home, and ultimately emigrated to America, landing in Baltimore in 1851.

On his arrival he was almost penniless, and to supply the necessaries of life he obtained employment in a paper box manufactory, and subsequently in a mattress factory, until about half a year later he made the acquaintance of Dr. Wiss. This gentleman desired to open a drug store, which he afterwards succeeded in doing, and Mr. Maisch took charge of the store for him, during a few months in 1850, after being instructed by Drs. Wiss and Vogler, and gaining more knowledge from books placed at his disposal by Dr. Wiss. Towards the end of 1851 the drug store was sold to other parties, and Maisch shortly after obtained employment in Washington, where he served as an assistant until 1853. He next removed to Philadelphia, as his parents and some of his sisters had arrived there from Europe. Until 1855 he acted as clerk in Philadelphia and New York, and in the later part of this year was employed in a chemical factory of Brooklyn. In 1856 Mr. Maisch returned to Philadelphia, and accepted the position of clerk with E. B. Garrigues and Rob't Shoemaker & Co., until 1859. He then gave instruction in a private school of practical pharmacy, conducted by the late Professor Parrish, at his store, Eighth and Arch Sts., Philadelphia. This school was then frequented by many young medical students who have since become "shining lights" in their profession.

Sometime in 1860 Maisch removed to New York, where in 1861 he was elected to the chair of Materia Medica in the New York College of Pharmacy. He at the same time occupied all his spare time in the laboratory of Dr. E. R. Squibb. In 1863 Prof. Maisch returned to Philadelphia to organize and conduct the U. S. Army Laboratory, proposed by Surgeon-General Hammond, and of this he was Director until the close of the war. In the two and a half years of the existence of the laboratory there was a saving of more than $750,000 to the government, owing to the preparations here made on a large scale. The close of the war brought his engagement here to an end. He immediately engaged in business for himself at 1607 Ridge avenue, until 1871, when he was compelled to dispose of his store in order to give his whole attention to his duties at the Philadelphia College of Pharmacy and the Permanent Secretaryship of our Association. In 1856 he became a member of our Association,* and in the year 1860 was elected Reporter on the Progress of Pharmacy. While in this office he introduced a new system in regard to the arrangement of the articles, which has since been retained by his successors. In 1863 he was made First Vice President; in 1865 was elected Permanent Secretary, which position he retained until the time of his death. When our Association in 1867 offered its services to the Legislatures of the several States, with the intention of formulating pharmacy laws, the deceased collected by correspondence with the Governors of

*The Chairman of the Committee on Membership will prepare an obituary notice to appear in his next report, embracing a fuller account of Prof. Maisch's labors for the Association.

the different States the laws and regulations then in force, and up to the time of his death was actively interested in this important subject.

The College of Pharmacy attracted the attention of Prof. Maisch as soon as he reached Philadelphia, and in a short time after he was elected a member, and became a contributor to its journal. The earnest manner and industrious habits of the young German made an indelible impression upon the editor of the journal, and the Professor of Pharmacy in the College, Wm. Procter, Jr. To such an extent had the subject of this sketch impressed his favorable qualities upon the members of the College and all who had come to know him, that it was not surprising to find that upon the relinquishment of the Chair of Pharmacy in 1866, by Prof. Procter, on account of ill health, John M. Maisch was called upon to fill the vacancy. In 1867, however, Prof. Maisch exchanged chairs with Prof. Parrish, and at the same time the title of the chair of Materia Medica, formerly held by Prof. Parrish, was enlarged, so that it became that of "Materia Medica and Botany." Prof. Maisch retained this chair until the time of his death, a period of twenty-six years, and the services which he has rendered to American Pharmacy during this time can never be forgotten.

More than two thousand students have profited by his thorough and painstaking instruction, and can attest to the profundity of his knowledge and the unwearied industry which he ever manifested in the discharge of his official duties.

Prof. Maisch's connection with the *American Journal of Pharmacy* began when he was but twenty-three years old, and in 1870, when Prof. Procter was compelled to resign the editorship on account of ill health, Prof. Maisch was unanimously elected to fill the position; and at the same time the *Journal* was enlarged, by making it a monthly instead of a bi-monthly publication. The year 1870 was an eventful one for him, for in addition to his other duties, he was called to take charge of the chemical laboratory, which had been organized in the college through the efforts of the Alumni Association.

His interest in pharmaceutical literature, and his desire to add to the sum of knowledge in his chosen profession, was manifested soon after he arrived in Philadelphia, and the first paper which he wrote for the *American Journal of Pharmacy* appeared in March, 1854, the title being "On the Adulteration of Drugs and Chemical Preparations." This was a subject which was always an attractive one to his mind at all periods of his professional career, many of his papers in the later years of his life being devoted to the detection of adulterations, sophistications, and accidental contaminations found in drugs. This was a natural consequence of his settling down to the conviction that his life work would be more in Pharmacology than Pharmacy, and his election to the chair of Materia Medica in 1867, and subsequently the issue of the *National Dispensatory*, and particularly the appearance of his work on "Organic Materia Medica," showed the main trend of his researches. The former work had Dr. Alfred Stillé as medical author, he furnishing the therapeutical contributions, whilst Prof. Maisch supplied the botanical, chemical, and pharmaceutical material. This work has gone through four editions. He doubtless felt the necessity, as his duties multiplied, of giving the most attention to Pharmacognosy, and it has been fortunate for American Pharmacy that he recognized the direction in which he could use his talents to the best advantage. That he was fond of chemical investigations no one can doubt; the many chemical papers which have been published will attest to this truth. His devotion to the interests of Pharmacy is shown by the fact that nearly all of his contributions have a bearing upon subjects more or less directly connected with the alleviation of human suffering.

In 1892 Prof. Maisch's friends noticed that at times he appeared to be suffering, and occasionally he was compelled to relinquish some of his lectures. It was not, however,

until April, 1893, that he experienced a difficulty in swallowing food. At first no one realized the significance of this symptom, and it was only after a considerable increase of this painful sensation, that he sought medical advice. Gradually the orifice of the oesophagus became smaller, and it was soon recognized that a malignant growth was pressing upon it to such an extent that solid food could no longer find an entrance into the stomach; and after five months of painful suffering, which he bore with fortitude and resignation, he peacefully passed away on the 10th of September, 1893. During the five months immediately preceding his death, he continued to perform every duty that he possibly could, whilst his faithful wife and children assisted him greatly by their devoted service. During the summer, the approaching meeting of our Association in Chicago, and the assembling of the International Congress at the same place, were events that he had looked forward to with particular interest. But when the month of August was reached, the progress of his disease was so great that he was compelled to relinquish all idea of being present. The grief of his friends at these gatherings upon learning his condition was heartfelt, and a most touching incident occurred when the President of the Pharmaceutical Society of Great Britain announced to the meeting that he was the bearer of the Hanbury Gold Medal, which had been awarded to Prof. Maisch for distinguished services, and for original research in the Natural History and Chemistry of Drugs. Fortunately this testimonial reached him whilst he was in full possession of his faculties, although suffering severely. His face, wasted by the long-continued pain to which he had been subjected, lit up with a smile of pleasure when he received it, but a few short days before his earthly existence closed. A review of his eventful life teaches the invaluable lesson of persistent application in the face of what were apparently insuperable obstacles. His mind was imbued with a love for science, and the characteristic which thoroughly pervaded all of Prof. Maisch's work as a scientist was the persistent search for truth, for he would never rest until he was satisfied that the utmost effort had been put forth to eliminate error; and it was the knowledge of this trait in his character which gave to his scientific opinions so much weight.

Outspoken often to brusqueness in condemning error, his mind was always open to conviction, and he was never ashamed to change his views when convinced that they were not correct. Deceased had a profound love for the country of his adoption, and although he had lived in America forty-three years, no one could ever mistake his nationality; his strong, rugged features, and the slight accent which was hardly ever absent from his speech, at once proclaimed his German birth. Having decided to make America his home, he applied himself with all his powers towards developing the science which he had chosen for his life work. It was no grudging service that he gave. Although loving his native country devotedly, he did not belong to the class who can find nothing in the country of their adoption to commend; but with rare wisdom, and without sacrificing truth, he believed he could accomplish more good, and serve the best interests of all more devotedly, by endeavoring to guide those who looked up to him as a leader in correct paths, without denouncing them for their inability to realize his ideal. These convictions, coupled with his staunch integrity, high sense of honor, and powerful intellect, had much to do with his success in strengthening his influence with his American brethren; and the heartfelt expressions of grief and regret which have been heard in every State of the Union, attest the universal regard and esteem with which he was held.

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James M. Good, St. Louis, Mo.
Henry Kraemer, New York City.
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A. B. Stevens, Ann Arbor, Mich.
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CHAS. CASPARI, JR., Baltimore, Md.

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Term Expires.		
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"	GUSTAVUS RAMSPERGER	New York, N. Y.
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"	WILLIAM C. ALPERS	Bayonne, N. J.

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CHARLES E. DOHME, Chairman,
CHARLES CASPARI, JR.,
D. M. R. CULBRETH.

On Prizes: (Appointed by the President.)

(See page viii.)

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa....	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	Samuel M. Colcord, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853..	Boston, Mass.....	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.....	*William B. Chapman*, Cincinnati.	Henry T. Cummings, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855..	New York, N. Y....	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.....	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	Frederick Stearns, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857..	Philadelphia, Pa.	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C...	*John L. Kidwell*, Georgetown, D. C.	Edward R. Squibb, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.....	Samuel M. Colcord, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y....	*Henry T. Kiersted*, New York.	William J. M. Gordon, Cincinnati.	William S. Thompson, Baltimore.	Theodore Metcalf, Boston.
Aug. 27, 1862..	Philadelphia, Pa.	*William Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863..	Baltimore, Md.....	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	Chas. A. Tufts, Dover, N. H.	*George W. Weyman*, Pittsburgh.
Sept. 21, 1864..	Cincinnati, O.....	William J. M Gordon, Cincinnati.	*Richard H. Stabler*, Alexandria, Va.	Enno Sander, St. Louis.	*Thomas Hollis*, Boston.

Sept. 5, 1865..	Boston, Mass.....	*Henry W. Lincoln*, Boston.
Aug. 22, 1866..	Detroit, Mich.....	Frederick Stearns, Detroit, Mich.
Sept. 10, 1867..	New York	*John Milhau*, New York.
Sept. 8, 1868..	Philadelphia, Pa....	*Edward Parrish*, Philadelphia.
Sept. 7, 1869..	Chicago, Ill.....	Ezekiel H. Sargent, Chicago.
Sept. 13, 1870..	Baltimore, Md.....	*Richard H. Stabler*. Alexandria, Va.
Sept. 12, 1871..	St. Louis, Mo	Enno Sander, St. Louis.
Sept. 3, 1872..	Cleveland, O.	Albert E. Ebert, Chicago.
Sept. 16, 1873..	Richmond, Va.....	John F. Hancock, Baltimore.
Sept. 8, 1874..	Louisville, Ky.....	C. Lewis Diehl, Louisville, Ky.
Sept. 7, 1875..	Boston, Mass.....	George F. H. Markoe, Boston.
Sept. 12, 1876..	Philadelphia, Pa....	Charles Bullock, Philadelphia.
Sept. 4, 1877..	Toronto, Can.....	William Saunders, London, Ont.
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Sept. 9, 1879..	Indianapolis, Ind. ..	George W. Sloan, Indianapolis, Ind.

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LIST OF OFFICERS. (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 14, 1880..	Saratoga, N. Y.	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington.	William Simpson, Raleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo....	*P. Wendover Bedford*, New York.	*Emlen Painter*, San Francisco.	George Leis, Lawrence, Kan.	*John F. Judge*, Cincinnati.
Sept. 12, 1882..	Niagara Falls, N. Y..	Charles A. Heinitsh, Lancaster, Pa.	John Ingalls, Macon, Ga.	Louis Dohme, Baltimore.	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883..	Washington, D. C...	William S. Thompson, Washington, D. C.	Charles Rice, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884..	Milwaukee, Wis	John Ingalls, Macon, Ga.	John A. Dadd, Milwaukee, Wis.	Henry Canning, Boston, Mass.	Charles F. Goodman, Omaha, Neb.
Sept. 8, 1885..	Pittsburgh, Pa.....	*Joseph Roberts*, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886..	Providence, R. I....	Chas. A. Tufts, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	M. W. Alexander, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.....	John U. Lloyd, Cincinnati, O.	M. W. Alexander, St. Louis, Mo.	A. K. Finlay, New Orleans, La.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich	M. W. Alexander, St. Louis, Mo.	Jas. Vernor, Detroit, Mich.	Fred. Wilcox, Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889..	San Francisco, Cal..	*Emlen Painter*, New York.	Karl Simmon, St. Paul, Minn.	Wm. M. Searby, San Francisco.	Jos. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890..	Old Pt. Comfort, Va.	A. B. Taylor, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore, Md.	Jas. M. Good, St. Louis, Mo.
April 27, 1891..	New Orleans, La....	A. K. Finlay, New Orleans, La.	Geo. J. Seabury, New York, N. Y.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	Sidney P. Watson, Atlanta, Ga.	Wm. H. Averill, Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill.....	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore, Md.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–93.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.
John M. Maisch, Philadelphia, 1865–93.
H. M. Whelpley, St. Louis, 1893.
Joseph P. Remington, Philadelphia, 1893.

CORRESPONDING SECRETARIES.

William Procter, Jr., 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–54.
Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62, and 1863–66.
John M. Maisch, Philadelphia, 1860–93.

LOCAL SECRETARIES.

For the meeting held in		For the meeting held in		For the meeting held in	
1867	*P. Wendover Bedford.*	1877	Henry J. Rose.	1886	*William B. Blanding.*
1868	Alfred B. Taylor.	1878	*Jesse W. Rankin.*	1887	George W. Voss.
1869	*Henry W. Fuller.*	1879	Eli Lilly.	1888	James Vernor.
1870	*J. Faris Moore.*	1880	Charles F. Fish.	1889	Edward W. Runyon.
1871	*William H. Crawford.*	1881	William T. Ford.	1890	Charles E. Dohme.
1872	*Henry C. Gaylord.*	1882	*Hiram E. Griffith.*	1891	A. K. Finlay.
1873	Thomas H. Hazard.	1883	Charles Becker.	1892	H. M. Whitney.
1874	Emil Scheffer.	1884	Henry C. Schranck.	1893	Henry Biroth.
1875	Samuel A. D. Sheppard.	1885	George A. Kelly.	1894	W. G. Smith.
1876	Adolphus W. Miller.				

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–91.
Chas. Rice, New York, N. Y., 1891–92.
Henry Kraemer, New York, N. Y., 1892–94.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	P. C. Candidus,	Mobile.
Arkansas,	John B. Bond, Main and Fifth streets,	Little Rock.
	William L. Dewoody,	Pine Bluff.
California,	William T. Wenzell, 322 Polk street,	San Francisco.
	George B. Flint, 1101 Broadway,	Oakland.
Colorado,	Edmund L. Scholtz, Sixteenth & Stout streets,	Denver.
Dist. of Columbia,	John A. Milburn, 1817 Sixteenth st., N. W.,	Washington.
Connecticut,	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
Delaware,	Linton Smith, Church and Bennett streets,	Wilmington.
Florida,	William Aird, Maggie & E. Brough streets,	Jacksonville.
Georgia,	Theo. Schumann, Whitehall & Hunter streets,	Atlanta.
	Robert H. Land, 812 Broad street,	Augusta.
	John Ingalls, Fourth and Poplar streets,	Macon.
Illinois,	David G. Plummer, 6 Main street,	Bradford.
	C. S. N. Hallberg, 358 Dearborn street,	Chicago.
	Charles Zimmerman, 423 S. Adams street,	Peoria.
Indiana,	Henry J. Schlaepfer, Second and Main streets,	Evansville.
	George W. Sloan, 22 W. Washington street,	Indianapolis.
	Jacob Baur, 701 Wabash avenue,	Terre Haute.
Iowa,	John W. Ballard, 106 West Second street,	Davenport.
	Theodore W. Ruete, 568 Main street,	Dubuque.
	George H. Schafer, 713 Front street,	Fort Madison.
	Silas H. Moore, 80 Fourth street,	Sioux City.

Kansas,	George Leis, 747 Massachusetts street,	Lawrence.
	Robert J. Brown, 113 Delaware street,	Leavenworth.
Kentucky,	George A. Zwick, Eleventh st. and Madison ave.,	Covington.
	William H. Averill, 435 Main street,	Frankfort.
	C. Lewis Diehl, Third street and Broadway,	Louisville.
Louisiana,	Alexander K. Finlay, 186 Camp street,	New Orleans.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Henry H. Hay, Free and Middle sts.,	Portland.
Maryland,	D. M. R. Culbreth, Charles and Eager streets,	Baltimore.
	Thomas W. Shryer, 111 Baltimore street,	Cumberland.
Massachusetts,	S. A. D. Sheppard, 1129 Washington street,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, Thompson Square,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	James E. Blake, 64 North Second street,	New Bedford.
	John H. Manning, 51 North street,	Pittsfield.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 178 Essex street,	Salem.
	William Bush, 56 Front street,	Worcester.
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	James Vernor, 235 Woodward avenue,	Detroit.
	Jacob Jesson, Western avenue and Jefferson st.,	Muskegon.
Minnesota,	E. Floyd Allen, 1020 Hennepin avenue,	Minneapolis.
	Karl Simmon, Seventh and Sibley streets,	St. Paul.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
	Matthew F. Ash, P. O. Box 129,	Jackson.
Missouri,	William T. Ford, 1305 Cherry street,	Kansas City.
	James M. Good, 2348 Olive street,	St. Louis.
Nebraska,	Charles F. Goodman, 1110 Farnham street,	Omaha.
Nevada,	William A. Perkins, 84 South C street,	Virginia City.
New Hampshire,	Francis C. Miville, 1023 Elm street,	Manchester.
	Nelson S. Whitman, 175 Main street,	Nashua.
New Jersey,	Wm. M. Oliver, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth st. & Lafayette ave.,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 861 Broad street,	Newark.
	Howard P. Reynolds, Park and North avenues,	Plainfield.
New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Du Bois, 281 Main street,	Catskill.
	John Hepburn, 103 Main street,	Flushing.
	Harvey G. Goodale, P. O. Box 29,	Jamaica.
	James T. King, Main and South streets,	Middletown.
	John McKesson, Jr., 91 Fulton street,	New York.
	G. H. Haass, 105 East Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 348 Broadway,	Saratoga.
	Charles W. Snow, 214 Warren street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	William Simpson, 101 Fayetteville street,	Raleigh.
	John H. Hardin, 124 South Front street,	Wilmington.

Ohio,	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George L. Hechler, 1099 Broadway,	Cleveland.
	Charles Huston, 47 South High street,	Columbus.
	Henry F. Kurfurst, 502 Xenia avenue,	Dayton.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohly, 602 S. St. Clair street,	Toledo.
Oregon,	Louis Blumauer, Fourth and Morrison streets,	Portland.
Pennsylvania,	Jacob A. Miller, Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 5 North Ninth street,	Lebanon.
	Richard M. Shoemaker, Fourth and Race streets,	Philadelphia.
	George A. Kelly, 101 Wood street,	Pittsburg.
	Philip M. Ziegler, 526 Penn street,	Reading.
	John M. McNeil, Broadway,	Scottdale.
	Edward A. Cornell, Fourth and Pine streets,	Williamsport.
Rhode Island,	Wm. H. Cotton, 226 Thames street,	Newport.
	Wm. K. Reynolds, 354 Friendship street,	Providence.
South Carolina,	Edward S. Burnham, 369 King street,	Charleston.
Tennessee,	Jas. S. Robinson, Second and Madison streets,	Memphis.
	John C. Wharton, Vine and Church streets,	Nashville.
Texas,	L. Myers Connor, 1101 Elm street,	Dallas.
	Thomas W. Powell, 10 Houston street,	Fort Worth.
	Geo. J. F. Schmitt, 507 W. Commerce street,	San Antonio.
Utah,	Frank A. Druehl, Main and 3d South streets,	Salt Lake City.
Vermont,	Geo. A. Crossman, 2 Simonds Block,	Brandon.
Virginia,	Edward C. Jackson, 523 Church street,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
Washington,	Henry E. Holmes,	Seattle.
West Virginia,	Edwin L. Boggs, Kanawha Bank Building,	Charleston.
	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
Wisconsin,	Albert H. Hollister, 3 N. Pinckney street,	Madison.
	John R. Drake, 365 East Water street,	Milwaukee.
Prov. Nova Scotia,	Francis C. Simson,	Halifax.
Prov. Ontario,	John Lowden, 53 Colborne street,	Toronto.
Prov. Quebec,	Henry R. Gray, 122 St. Lawrence Main street,	Montreal.

THE PERMANENT FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are three permanent Funds at the present time, all of which are invested in government bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named, a revised Constitution was reported by a committee, and, after consideration, adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), contained the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings. p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87–96), and is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the annual interest of which only shall be used by the Association for its current expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52) so as to apply also to those who have been members for over twenty years (see Chapter VIII., Article 4 of By-Laws). Under this clause the life membership (new style) of the present roll is thirty-seven, as published in the Proceedings, pages 356.

The Treasurer's report for 1880 (page 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884

(p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147), it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471), the Association ordered again a transfer to the same fund of $4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the Government securities in which the Life Membership Fund is invested. The report published on page 56 of the present volume shows that on July 1st, 1893, the value of the Life Membership Fund was $10,062.47, of which sum *the annual interest only shall be used by the Association for its current expenses.*

THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products: the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; and for 1891, to John U. Lloyd.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On July 1st, 1893 (Proceedings, p. 55), its reported value was $724.18. The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science

connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526, 528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII. (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this Fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Rob. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892, and $50 again to the same investigator, as shown in the present volume.

The original sum of $1117.81 ($525+582.81) had increased in 1883 to $1232.76. Since 1887 the securities in which the Fund is invested are specified in the reports of the Chairman of the Council; the reported value was $1398.82 on July 1, 1893 (see Proceedings, p. 55). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE GENERAL FUND.

In October, 1891 (see Proceedings 1892, page 13), the Council instructed the Treasurer to draw from the cash on deposit a sufficient sum and purchase therewith three bonds, one thousand dollars each, the same to be such bonds as shall be approved by the Finance Committee, said bonds to be registered in the name of the Treasurer of the American Pharmaceutical Association, and placed in the custody of the Chairman of the Council.

The investment was made in bonds of the American Security and Trust Company at Washington, D. C., for the sum of $3021.62 (see Proceedings 1892, pages 27 and 28).

PRIZES.

The following resolutions were adopted August 15, 1893 (see page 56, Proc. 1893):

Resolved, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of $150.00, and apportioned as follows: $75.00 for the first, $50.00 for the second, and $25.00 for the third prize.

Resolved, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

Resolved, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper.

For names of members of this committee see page viii.

The old resolution on Prizes which the above replaces will be fouud on page 506 of the Proceedings for 1887.

CONTENTS.

APPENDIX.

PREFATORY NOTICE.

THE sad loss which this Association has suffered from the death of its Permanent Secretary, John M. Maisch, on September 10th, 1893,* has caused a delay of about two months in the issue of this volume; during the last illness of our distinguished officer, his arduous duties were ac ceptably performed by his devoted daughter, Miss M. A. Maisch, who also prepared for publication the first sixty pages of these proceedings.

Henry M. Whelpley acted as Secretary at the Chicago meeting, by appointment of the President as provided by the by-laws; the present Secretary was elected by the vote of Council, about one month after the decease of the former Permanent Secretary. Although some delay and difficulty have been experienced incident to the changes made necessary by the facts above stated, it is earnestly hoped that the present volume will be regarded by the members as a worthy companion of its predecessors.

The distribution of the printed Minutes, with the papers read at the meeting, in advance of the Proceedings, which was inaugurated in 1891, was continued after the last meeting, in accordance with the recommendation of the Association. A pamphlet was thus sent out to the members, covering 365 printed pages of the present volume. Members who have paid their annual dues for 1893 are entitled to this volume, which will be sent to the address printed in the alphabetical list on pages 1027, etc., unless otherwise informed. A list of queries suitable for investigation has not been printed by the Committee.

With the object of securing for the Proceedings as wide a distribution as possible, the Committee on Publication offer the different issues at the following reduced rates:

		PAPER COVER.	BOUND CLOTH.
1851, 1852, 1853, 1854, 1855	each	$ .25	$
1857	"	.40	.50
1858, 1864, 1865	"	.75	
1858, 1859, 1860, 1862, 1863, 1864, 1865	"		1.00
1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873	"	1.00	1.50
1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883	"	2.50	3.00
1884, 1885, 1886, 1887	"	3.50	4.00
1888, 1889, 1890, 1891, 1892, 1893	"	5.00	5.50

* See page iii.

IN SETS (EXCLUSIVE OF THE POSTAGE OR EXPRESS CHARGES).

For any two or three volumes a discount of 10 per cent. on the above prices.

For any four to eight volumes a discount of 20 per cent. on the above prices.

For any nine to fifteen volumes a discount of 30 per cent. on the above prices.

For any sixteen to twenty-two volumes a discount of 40 per cent. on the above prices.

For any twenty-three to thirty-two volumes a discount of 50 per cent. on the above prices.

For any more than thirty-two volumes a discount of 60 per cent. on the above prices.

1856 is out of print; none published in 1861.

Beginning with the first issue, in 1851, the actual cost of partial or complete sets—bound in cloth as far as on hand—will be as follows:

To and Including.	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including.	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including.	Number of Vols.	Price by Single Vols.	Price the Set Net.
1855	5	$1 25	$1 00	1870	18	$16 25	$9 75	1882	30	$47 75	$23 50
1857	6	1 75	1 40	1871	19	17 75	10 65	1883	31	50 75	23 50
1858	7	2 75	2 20	1872	20	19 25	11 55	1884	32	54 72	23 50
1859	8	3 75	3 00	1873	21	20 75	12 45	1885	33	58 75	23 50
1860	9	4 75	3 32	1874	22	23 75	13 25	1886	34	62 75	25 10
1862	10	5 75	4 02	1875	23	26 75	13 38	1887	35	66 75	26 70
1863	11	6 75	4 72	1876	24	29 75	14 88	1888	36	72 25	28 90
1864	12	7 75	5 42	1877	25	32 75	16 38	1889	37	77 75	31 10
1865	13	8 75	6 12	1878	26	35 75	17 88	1890	38	83 25	33 30
1866	14	10 25	7 18	1879	27	38 75	19 38	1891	39	88 75	35 50
1867	15	11 75	7 75	1880	28	41 75	20 88	1892	40	94 25	37 70
1868	16	13 25	7 95	1881	29	44 75	22 38	1893	41	99 75	39 90
1869	17	14 75	8 85								

Orders for Proceedings should be sent to the Permanent Secretary, 1832 Pine street, Philadelphia, Pa.

The gold badge, recently designed, may be procured from the Permanent Secretary on receipt of $2.

Blank forms of applications and recommendations for membership may be obtained from the Permanent Secretary or from the Committee on Membership; when properly filled up they should be sent to the Secretary of the Committee on Membership, Geo. W. Kennedy, Pottsville, Pa., at least one week before the meeting; if sent later, they should be addressed to him in the care of the Local Secretary, Whitefoord G. Smith, Asheville, N. C.

The forty-second annual meeting of the Association will convene in Asheville, North Carolina, on the first Monday (3d day) of September, 1894, at 3 o'clock p. m.

MINUTES

OF THE

FORTY-FIRST ANNUAL MEETING.

THE forty-first annual meeting of the American Pharmaceutical Association was called to order in the Hall of Washington at the Memorial Art Palace, Michigan Avenue, Chicago, Ill., shortly after three o'clock on Monday afternoon, August 14th, 1893, by President Remington, who announced that owing to the absence of Permanent Secretary Maisch, he would appoint Professor H. M. Whelpley, of St. Louis, Secretary *pro tempore*.

President Remington then introduced Dr. Selim H. Peabody, Chief of the Department of Liberal Arts of the World's Columbian Exposition, who welcomed the Association to the city of Chicago in the following terms:

Mr. President, Ladies and Gentlemen:

The World's Columbian Exposition presents three distinct and readily distinguishable phases. The first is the phase of construction, that which went out into what was almost a shaking, quaking bog, filled with sand, reeds and streaks of water, and built upon it the great White City which we recognize below us on the lake shore. It excavated the lagoons, it surrounded them with structures of the noblest magnificence, it brought all that is choice, grand and beautiful from Grecian, from Roman, from medieval, from modern architecture, and made the beautiful exhalation as of a dream that came up almost in a night. Two years ago last February I was upon that place, and there was nothing but water and rushes and the singing of the frogs; and to-day there is the grandest scene which, for these purposes, the world has ever witnessed, and which I doubt if it will again soon see.

The second phase is the phase of exhibition. While Mr. Burnham and his assistants have gone on with this noble structure, with the work of the architect, and of the sculptor, and of the painter, Mr. Davis and his assistants have reached all around this wide world and gathered from every quarter, from every clime, from every nation, these materials which fill the buildings from one end to the other with the largest and finest exhibit which the world has ever seen. Every department of art and science is there represented, all nations compete with each other for recognition in the usefulness or beauty of their exhibits; France and Germany—traditional names!—meet together, side by side, in friendly contest for supremacy.

And then there is the third phase of this exposition, that which deals not with matter but with mind, not with things but men, and so there has come to this point, a long,

grand procession from all the world, including in its numbers those dealing in literature, in science, in art, in education, in religion. They come by ranks, by regiments, by brigades, by divisions, one grand army, and as each portion passes this platform it halts, salutes, and waits for the answering salute. And so it becomes the duty of one or another, representing in a larger or a feebler way, the city and the citizens of Chicago to accept the salute, and to say to those who come: "We welcome you to all the grandeur of the exhibition, to all the beauty of the season, to all the enjoyments of the city, to everything which we can offer you to make your stay here lovely and memorable." And such, gentlemen, is my office here to-day. I wish that some person might have been appointed to this duty who could more fitly represent the civic responsibilities of this great city, who could more fitly proffer to you all that Chicago has to offer, all the welcome which she has to give, so that it might sink down into your hearts and remain a joy with you here and a glad remembrance as you go hence.

It is the custom, I believe, of those who have this duty to perform to say something about Chicago, its extent and its accomplishments. I understand, I think, as well as most, what these grandeurs, these great things are; but I sometimes think that they are presented rather too numerously, and so I shall not have much to say about them. I know that Chicago is the greatest grain market, the greatest lumber market, the greatest provision market in the world, and there are certain other things which I believe might be claimed for it. I care for none of these things, excepting that they have given to Chicago the foundations for and the means by which to raise certain grand superstructures which she is now busy in preparing and in constructing. I have very little use for wealth except as it may be used to increase the comforts, the blessings, the privileges of men, and I have very little respect for the man who accumulates his millions and does not turn about and distribute them through the world for the benefit of mankind. And so it is that here, in Chicago, this wealth has been accumulating so grandly since the day when all the place upon which you stand, and miles along this coast, were simply one field of ashes, only a little more than twenty years ago; since that time Chicago has recuperated, her men have established themselves, and have in so many instances, now patent to most of you, used the wealth they have accumulated in a way to foster literature, and science and art. For those things, I would plead that honor be granted to Chicago. She has builded three grand universities, one of them no doubt partly by the munificence of a citizen from abroad, but mostly by the aid of her own citizens, with a capital of more than six millions of dollars. She has builded, or has in progress of construction, four magnificent libraries, each of which has an endowment, or the equivalent thereof, of more than two millions of dollars. Grandly has she developed one phase of science; others will come.

I refer now to the brigade of the medical profession, and in it are various groups and departments, one of which is before us to-day. I am impressed with the wonderful advancement that has taken place in this profession within my own remembrance. When my grandfather rode the circuit in southern New Hampshire, either on horseback or in a sleigh, he carried all his surgical apparatus, and all his drug-store, and everything else that he might wish, either in his saddle-bags or in a little sack that he deposited in the bottom of his vehicle. In this little sack I believe there were three or four specifics. I imagine he had some calomel there, and some ipecac, some Dover's powder, and possibly some quinine; and probably if one did not work the other would. But there has come out of those days a development of the profession of medicine accompanied with the development of the science in all its other phases of chemistry, of biology, of pathology—I need not cite the list, for you know that list better than myself—there has been this development in all its purely scientific phases, covering the entire field and so differentiated that it is not possible for one man to ride the circuit and carry his entire profession in the small scope of his saddle-bags. And out of this development there has

come the development of the pharmacist's profession; for that profession, it seems to me, in its present phase, is simply the growth of a comparatively few years. It certainly is but a short time since the physician was expected to be his own pharmacist, to carry his own simples and his own medicines with him, and to dispense them as he went on. He took his medicines with him, and he rarely sent his prescriptions elsewhere to be filled. And so your profession has established itself in schools, and in my enumeration of what Chicago has done, I must not forget that besides her universities, or as parts thereof, she has established, I believe, seven schools of medical science, two schools of pharmacy, one of veterinary science, and four of dental science, so that this brigade is thoroughly equipped and provided for.

Now, I desire to say to you that Chicago welcomes you most heartily to all that she has to offer, to all the privileges, to all the enjoyments connected with the Fair, to her homes, her social life, to whatever you may desire, and in view of this I trust that when you shall return to your homes and your duties, it will be feeling that Chicago as a host, in giving to you of her abundance, has given you cause to remember her with satisfaction and delight in all your future lives. (Applause.)

President Remington called upon Mr. A. P. Preston, First Vice-President, to reply to the address of welcome, on behalf of the Association.

MR. PRESTON: *Mr. President:* By your favor, sir, I am permitted to respond to the cordial welcome which the gentleman has just given us to this beautiful city, and in behalf of the ladies and gentlemen present I desire to thank him most heartily for the kind words that he has spoken.

The members of the American Pharmaceutical Association have come to Chicago with two specific purposes in view. In the first place, to hold the forty-first annual meeting of the Association, and at that meeting, from the interchange of thought, from the wise words that will fall from the lips of the learned members we have with us, formulate such opinions and ideas as will be of practical and theoretical value to members of our profession throughout the civilized world. In the second place, Mr. President, we have come here to join with the gentleman who has addressed us, and the citizens of Chicago, in glorifying in the fact that the Columbian Exposition now being held is the grandest, most stupendous, and most marvelous ever known in the world's history of international expositions. We have come here, sir, from all parts of this grand country of ours—and in this hall, with its significant name, we admit how proud we are that we are American citizens. We gladly admit, too, sir, that no matter from what section of the country we may have come, we are ready to lay aside on this occasion, all feelings of sectional interest and unite for the common good.

But, Mr. President, although we are American citizens, we must not permit ourselves to think that we cannot be taught. Our friends from far-off countries, who have so generously come here, can teach us many things—our friends from England, from Germany, from Belgium, Sweden, France, Spain, Italy, and all the other countries, had just the same right to be born, just the same right to live, and will have just the same right to die, as we have ourselves. We should not forget, sir, that they have the same love of country that we have, and who shall say more of egotism than the average American?

Now, Mr. President, let me express the hope that we shall all use our talents as we best can. Let me dare to express the hope, sir, that this grand exposition now being held will emphasize the fact to us, no matter where we may live—whether across the water or whether in this grand and beautiful country—that we are all brothers; and let me dare to hope further, that the time will come when personal, when national, and when international difficulties and troubles shall be settled by peaceful methods, and that Krupp's guns and all the other terrible engines of warfare which we see in walking

about this exposition will be looked upon as implements of barbarous times, even though they were used by people who knew something about chemistry and something about electricity.

Allow me to add, in conclusion, that the gentleman has given us a most cordial welcome to this city. He has told us, eloquently and well, of the many things that have been done. Why, my friends, just stop and think of it! If any of you live down in that part of the country where I live, where we sit down in that conservative, old, quiet way, and think to ourselves that there can be no good outside of New England, you will realize what I realized when I made my first pilgrimage to the West—that they have the grandest people here, the most whole-souled people you will find anywhere, and they are always glad to welcome us. Again I thank the gentleman who has so eloquently presented that welcome. I assure him that we most sincerely appreciate the kindly sentiments he has expressed, and that we feel, even now, that our forty-first annual meeting, held in the city of Chicago, is sure to ever remain memorable in the history of our Association.

Mr. Henry Biroth, Local Secretary, was introduced by President Remington.

Mr. Biroth: *Mr. President, Ladies and Gentlemen:* On behalf of the druggists of Chicago, and as your Local Secretary, I bid you a hearty welcome to this city. We have expected you, year after year; we knew you would eventually come, for we believed that you could not have forgotten our hospitality of 1869. Chicago has opened her portals to all nations of the world, but to the children of her own country she extends a welcome of more than mere formalities. She receives you with a feeling of good fellowship, with outstretched hands and a warm heart. I am sure you will take a lively interest in our meetings, and I trust that you will enjoy the entertainments tendered you. To-night, I shall take the liberty of leading you away from life's hurry and flurry and worry, away to the land of the fairies, produced by the witchcraft of American genius and talent, to the White City of the World's Columbian Exposition of 1893.

Vice-President Watson here took the chair, and President Remington delivered his annual address, which was as follows:

Fellow Members of the American Pharmaceutical Association:

For the second time in the 41 years' existence of this body, the place of meeting which has been chosen falls upon the city of Chicago. What a marvelous checkered history has marked the years since 1869, the year in which we met in this city, the acknowledged Queen of the Lakes. At that time the resistless energy, the indomitable force, and the marvelous business capacity, which have become synonymous terms with Chicago's greatness, were but feebly foreshadowed. It required a visit from the destroying angel of fire to first call the attention of the world to the little city on the prairies, which was even then demanding the recognition from her sisters which she has since earned.

The present meeting has been projected, and some of the details arranged in advance, for a longer period than ever before in the history of the Association, the great moving cause for which has been the assembling in this city of the nations of the world to do honor to that courageous, intrepid navigator who opened up to civilization the New World, and to whose memory every American owes a lasting debt of gratitude. The assembling of the representatives of all habitable climes at this spot, at this time, in recognition of America's right to be ranked among the great nations of the earth, renders the time and place most opportune for the meeting of the votaries of science; and the members of the pharmaceutical profession, from the nature of their calling, will find in the Exposition as many objects of interest and profit as any of the vast horde of visitors to this Mecca.

The Association thoroughly recognizes the power of this counter-attraction, and has provided for sessions on alternate days; the programme which has been arranged by the committee has been carefully planned, so that the interests of the Association shall not suffer from the competition; and if the members present will cheerfully lend their aid, by conforming as far as possible with the programme, they cannot fail to carry away from this city a never-failing source of inspiration, and the week spent here will be crowded with memories which will strengthen as the years of our lives roll on, and be in the future among the precious treasures which shall never fade away.

In accordance with the provisions of the By-Laws of this body, it becomes my duty to address you upon the events which are of special interest to the Association, and first must come the duty to welcome our guests, the members of the Seventh International Congress, whom you invited to meet with us, and who are to organize in a few days the first International Congress held in America; to these, and to all other invited guests, the Association extends a hearty welcome, and with this a cordial invitation to favor us with their counsel, knowledge and experience by engaging in the discussions which are soon to be entered upon. We have also present upon this occasion, for the first time, delegates from that representative national body, the American Medical Association, and their presence adds much weight to the belief which is fast gaining ground in America, that the relations of the professions of medicine and pharmacy are rapidly developing towards that point which has been in time past so earnestly sought for, when both may meet on common ground and labor together to mutual advantage. It has been three years since the American Medical Association first invited this Association to send twenty-five delegates to its annual meeting at Washington; this invitation has been repeated annually, and a Section of Materia Medica and Pharmacy has been organized by them; our delegates have communicated papers to this Section, and have been urged to engage in the subjects for discussion; this invitation has always been accepted. Every courtesy has been shown them, and the utmost freedom of action consistent with the attainment of mutual benefit has been accorded; this much having been accomplished, it becomes an important question whether the time has not arrived and the way paved for the formation of a joint body or commission, organized on a scale commensurate with its importance, which shall be charged with the duty of developing to the utmost such lines of labor or scientific research which shall improve our pharmacopœia, propose plans for reforming abuses, and strengthen the hands of those who are endeavoring to secure needed and proper legislation for restricting the practice of medicine and pharmacy to those only who are qualified to perform such responsible duties. If such a joint commission be ever founded, it would undoubtedly fall to the lot of this Association to take a prominent part, as it has in the organization of the most important joint committee known to both professions, that for revising the Pharmacopœia.

It must be a gratification to all of us to know that a majority of the members of each Committee of Revision for the last 30 years, have been members of this Association. In 1860, out of nine members of the Committee of Revision, we find the names of six of our members: Procter, Squibb, Taylor, Carney, Cummings, and Thompson; in 1870 the Committee was enlarged to fifteen, and eight of the number elected were members of this Association, as follows: Wood, Maisch, Squibb, Moore, Ebert, Wenzell, Taylor, and Markoe. In 1880, the Convention voted for another enlargement of the Committee, and of the twenty-five selected, fifteen of our members were chosen: Rice, Bedford, Prescott, Maisch, Doliber, Diehl, Dohme, Judge, Markoe, Parsons, Scheffer, Thompson, Taylor, Oldberg, and Remington. Finally in 1890, of the twenty-six forming the Committee, sixteen were members of this Association, viz.: Rice, Bedford, Curtman, Diehl, Eccles, Gregory, Hallberg, Maisch, Markoe, Mohr, Oldberg, Power, Rusby, Sayre, Taylor and Remington.

In this connection, as one of the events of this year, the advent of the "New Pharma-

copoeia" is just announced, and I know that I voice the sentiment of this Association, when on your behalf I tender to the Committee of Revision and Publication of the Pharmacopœia of the United States of America, your most hearty congratulations upon the completion of their labors. The Chairman of the Committee, Dr. Charles Rice, has forwarded to this meeting for your inspection, the first copy of the latest revision which has issued from the press; and although the ink is now scarcely dry upon its pages, even a slight perusal of its contents will convince the reader that their labors have been arduous, while those of the talented Chairman have been little less than herculean.

Since the work will now be soon sent broadcast over the land, it will be appropriate for me to make you acquainted with some of its prominent features. For the first time in its history, the United States Pharmacopœia is sent forth solely under the ownership and control of its Committee of Publication, publishers and bookmakers being employed by them, under legal contracts, to issue it in accordance with approved mercantile usages.

The price of the book, considering its increased size, is just one-half that of the former Pharmacopœia; this must of necessity secure the widest possible distribution.

It is proposed that the income, after deducting necessary expenses, be devoted in the future to conducting researches which will be of service in subsequent revisions of the work, and redound to the credit of American Pharmacy.

In glancing through its pages, the first striking change that will be noticed is the introduction of the principle of solids by weight and liquids by measure, instead of that of "parts by weight" of the former Pharmacopœia, the metric system being adopted, in order to express this principle in the most rational and simple manner, for in no other system of weights and measures is the commensurability of the units so easily effected; it is believed that the radical change in weights and measures will ultimately result in great benefit to pharmacy.

Three years have elapsed since the National Convention at Washington directed the committee to adopt the metric system; this fact has been widely published and commented upon; in addition, upon the title page of the new Pharmacopœia will be seen the line, "Official after January 1st, 1894," and the issue of the book at this time will permit it to be in the hands of every pharmacist for a considerable period before it is expected to go actually into force, so that it cannot be said that the pharmaceutical profession is entirely unprepared for this radical change, which was nevertheless inevitable.

The metric system is admirably adapted for pharmaceutical operations, and it will require but a short time for the pharmacist to become familiar with it practically; this accomplished, a return to the old method will not be thought of.

The subject of standardization, which became such a burning question at the time of the meeting of the Convention, has been settled by the committee in the only way possible; much careful investigation resulted in their reaching the unanimous conclusion that reliable methods of assay, resulting in approximately uniform results, when carried out by different operators, and permitting a strict identification of the products, are available at present for only a few drugs, and opium, cinchona, and nux vomica have been selected.

The introduction of assay processes which are in the least open to question, strikes at the "authority of the authority," and destroys the usefulness of a standard.

The revision of the tests and descriptions of the chemicals have been thorough and laborious. Volumetric methods supplant former gravimetric ones, whenever possible, thus rendering analyses by the pharmacist more practicable, by reducing the examinations of medicinal chemicals to the simplest and most rapid methods consistent with accuracy.

In establishing limits for the purity of these substances, good judgment must always be used, for by permitting the presence of a little contaminating by-product in some

chemicals, it is possible to change the therapeutic action of the original substance; on the other hand, if the highest degree of purity attainable by chemical science be required, the cost of the process practically prohibits the use of the substance in medicine; between these extremes lies the safe middle ground; if the contaminating substance does not alter the therapeutic action of the chemical, but merely dilutes it to a trifling degree, then the Pharmacopœia, by a reliable test, limits the extent of such dilution, so that accurate medication is possible; if on the other hand, the contamination changes the therapeutic properties of the body, no consideration of cost should interfere with the establishment of a standard for purity, which will exclude all such contaminations, thus enabling the physician to place absolute dependence upon the action of that remedy.

The subject of nomenclature, always an important one in pharmacopœial revision, was one of unusual interest in the present work; so-called reforms have been periodically started, and many ambitious projects have come to naught, mainly because of their impracticability, or lack of sufficient usefulness to warrant the abandonment of the names already in constant and familiar use. In selecting pharmacopœial names for the substances, the guiding principle of the greatest brevity, consistent with accuracy, is of the utmost importance.

The prevailing custom of our modern chemists of expressing the complete constitution of the carbon compounds by using the names, either in whole or part, of its constituents, is in most respects a capital one, but it has its limitations for pharmacopœial purposes; we are all familiar with the unpronounceable and readily forgotten names, and fortunately the committee have relegated them, whenever it is necessary to use them at all, to the synonym list.

On the other hand the arguments of those chemists had little force, who are laboring earnestly to phoneticize chemical nomenclature, by urging the adoption of the spelling of "oxide," "bromide," "chloride," etc., without the final "e;" who seek to destroy the prevailing distinction between alkaloids, and glucosides, and neutral principles, by spelling "strychnine" without the "e," and who have fallen in love with the use of "f" instead of "ph," and insist upon having their "sulphur, phosphorous and phosphate," curtailed to "sulfur, fosforous and fosfate."

The use of trade or proprietary names in the Pharmacopœia, has of course been avoided, and such substances as have earned a place in the work, through their extensive use, have been given names which are expressive and suitable; but the important change in chemical nomenclature, in the new Pharmacopœia, which is believed will commend itself to all, and which has been in practical use by most chemists, is the dropping of the word "of" in designating chemical compounds, and then transferring the metallic or basylous component to the first place: "sulphate of sodium" thus becomes "sodium sulphate;" the salts of mercury, iron and manganese, etc., have been differentiated, and the higher and lower forms are now rendered with the "ic" and "ous" terminations, thus we have ferric and ferrous sulphates, mercuric and mercurous chlorides, etc.

In the botanical nomenclature, quite a large number of changes will be noticed; these are mostly in accord with the views of the Botanical Club of the American Association for the Advancement of Science, and while many of the changes are radical, it must be admitted that the guiding principle of priority, clearly established and based on correct identification, constitutes the most rational basis for reforms in botanical nomenclature.

In pharmacy it is believed that the new book will show evidences of progress and prove a good representative of the solid achievements of the past decade.

The process of percolation, which, as is well known, has been the subject of especial study in this country, will receive an additional impetus on account of a wider application of its principles than ever before. Discrimination, of course, has been manifested, and in a few instances, where the physical structure of the drug rendered percolation impracticable, maceration has been preferred.

The important classes of liquid galenicals, the Fluid Extracts and Tinctures, have had important additions to their number. In nomenclature, a new class, "Emulsa," has been created, and some of the former "mixtures" placed in it, and it is hoped that before another revision, pharmacy will have advanced to such a degree that we may have accurate definitions of the various classes of preparations; for it must be universally admitted that no science can progress satisfactorily until the important subject of nomenclature rests upon a lasting and accurate foundation, and these views are recognized today, as they have never been before, not only in chemistry and botany, but in every branch of science known to man.

Fellow members, you have, I trust, in the book which has been presented, one which will add lustre to the escutcheon of American Pharmacy. You have waited patiently for its appearance; no unseemly clamor has marred the work of the committee; harmony has prevailed inside and outside; and it is now fairly launched on its mission of usefulness.

It is too much to expect that it will escape criticism, but it is not too much to expect the fair treatment that it deserves. It represents the combined views of men having varied talents and environments in the professions of medicine and pharmacy; the needs of the different sections of our vast country have been heeded and conscientiously weighed; the results which have been reached reflect the earnest and careful attention of impartial judges.

This cardinal principle in revising an authority has not been lost sight of,—that if a Pharmacopœia is to be truly representative of a nation's advancement in the sciences which form the foundation of pharmacy, no narrow interpretation of the needs of the various sections of the country must be suffered to guide its authors; the book must stand for the whole country, and be equally acceptable in every state, from Canada to California, and from Florida to Alaska.

The issue of the Pharmacopœia will doubtless lead to the revision of our National Formulary, and there is every prospect that this work will prove, when published, of even greater value than the one which is now in use, and based on the Pharmacopœia of 1880. The publication of this little book grew out of a need for an authoritative guide to pharmacists, in preparing unofficial remedies; it has had an unusually successful career; the report which will be presented at this meeting will show that a large number of copies has been sold and distributed; the cost to the pharmacist has been trifling; the utmost liberality in permitting republication, abstracts, etc., has been shown, and notwithstanding the low price and small margin on the cost of manufacturing, there will remain in our treasury the substantial profit of $3000. There is no good reason why these results cannot be materially increased in the next edition, if in addition the name be changed to the "American Formulary," issued by the authority of the American Pharmaceutical Association; the connection between the two will be much more pronounced, and both the Association and Formulary will reap the benefit, through the suggestiveness of the title.

The proceedings of the Association have been regularly distributed by the Permanent Secretary, and the custom of late years, of issuing the minutes printed in pamphlet form, "in advance of the bound proceedings," is of great service to our members generally, and will doubtless be continued in the future. The suggestion, that in lieu of the annual proceedings, a quarterly journal be established, which will contain the report on the progress of pharmacy and current matters of interest, is not recommended for adoption at present; the disadvantage of the delay in publishing the proceedings having been met by the issue of the pamphlet before mentioned; in addition to this, the rapid multiplication of pharmaceutical journals in this country seems to have fully supplied all demands, rendering the success of another at this time problematical in the extreme.

While careful deliberation upon the subjects immediately affecting the interests of the Association should probably be the first occupation of our minds, the researches and labors of the great world beyond the sea should command our most serious consideration.

This is especially the age of synthesis; analysis is active and full of life, but constructive methods at present promise to the waiting world a more liberal and practical return than those which are destructive, and applied chemistry is calling large numbers to her allegiance. For us as pharmacists, analysis must forever be the favorite study, for the selection aud testing of medicines are most important duties.

The last year has witnessed a still greater development in chemical research, and as in electrical science, it is entirely beyond human ken to foretell the possibilities of the future. Organic chemistry to-day unquestionably embraces a greater number of observed and recorded phenomena than any other science. Our chemical journals come to us teeming with facts, inventions and discoveries, which tax the minds of the most active and erudite, to even glance through and note. One must be exceptionally gifted with mental endowments to be able to state, even in meagre outline, the present status of this branch of science. The accumulation of facts which underlie the massive structure has been rendered possible solely through the development of "specialism." The German professor of Greek literature, who upon his death-bed confessed with much poignant regret the failure of his life, because his study of the Greek articles had been unwisely extended to two, instead of being limited to one, admirably expressed the thought of the age; yet while we are not in danger of going too far in this direction, and it is customary for chemists to pity the worker who has not reached the point in his development where his field is cribbed, cabined and confined that he can produce a mass of observed phenomena which may ultimately be valuable, still, all must have realized that the great need of the hour is for calling into life some great generalizing, comprehensive intellect, with a power of grasping these facts, and arranging and classifying them in an orderly and systematic manner. Let us not cease to hope for this grand master mind, who will ultimately accomplish for the modern organic chemistry of our day, what Cuvier and Linnæus in their age did for the branches of science with which their names will be forever indissolubly linked.

The effect upon pharmacy and medicine of this extraordinary activity in the synthetical departments of chemical science has been profound; new chemical compounds and new classes of compounds have been flooding commerce like a deluge, the more valuable ones being protected by letters patent or by copyright names; competition among the large manufacturers is extremely fierce, and the result to the average pharmacist has been to produce confusion, uncertainty and annoyance; the representatives of one manufacturer no sooner visit him and the neighboring physicians, before a competitor follows on his heels with another remedy, claiming even greater advantages, and which does not possess the disadvantages of the one that has already been added to the stock; it might be supposed that the Pharmacopœia would accept remedies of this class, but the convention in 1890 clearly defined its position as follows, in article 6 of the General Principles: "No medicinal substance which cannot be produced otherwise than under a patented process, or which is protected by proprietary right, shall be introduced into the Pharmacopœia." It is clear that any substance which is controlled by one manufacturer or corporation "becomes a law unto itself," any any test, limitation, or standard of purity, established by the Pharmacopœia could be rendered nugatory at the whim of the manufacturer if it suited his purposes, and the Pharmacopœia would stultify itself, by admitting a substance under certain impurity limitations, if it was found subsequently that the only substance that could be obtained in the market was one which deviated from the standard established; whenever the production of the substance is solely under the control of one person, firm, or corporation, and it is impossible to compel the manufac-

ture of a preparation conforming to the official standard, there is but one course to pursue, namely, that of exclusion.

It has not been deemed necessary, in this address, to bring forward at this time for your consideration a new plan for the control of the sale of various medicinal preparations, which have long been sold by druggists, but which have either shaken their allegiance to the apothecary, or have been appropriated by merchants in other vocations, who have for years cast longing eyes upon the much-talked-of profits from their sale.

It would seem to accord with the universal "fitness of things" to assert that the proper man to sell medicines is the medicine man, and it is surely in the interest of the common weal to have their sale controlled by educated and specially trained dispensers of remedies, which remedies are often dangerous in the hands of the inexperienced. But it must not be forgotten that all commodities (medicines not excepted) will be bought and sold in commerce, according to the laws of trade, and all efforts to limit the sale of such commodities must be framed in obedience to these well known laws. The wisdom of our Commercial Section can be trusted to pilot the Association in a safe course through these troublous waters, and on their sagacious and earnest efforts we may rely with certainty for such relief as is possible. The Sections of Scientific Papers and Education and Legislation, will prove interesting and full of instruction to all our members, and without anticipating any of their work, it can be safely promised that the papers which will be read, and the discussions to be entered upon, will be of absorbing interest.

Finally, your presiding officer desires to ask for your indulgence in the transaction of the business which is to come before us; he trusts that the forbearance and the kind consideration which have always characterized the meetings of the American Pharmaceutical Association may not be withheld, and has the sincere desire that every member may realize to the utmost every anticipation; and when the hour of adjournment is reached, may it be with hearts full of satisfaction, that this welcome verdict may be reached, "it has been the best meeting in our history."

On motion of Mr. Candidus, the President's address was directed to be referred to a committee of three to consider and report upon the suggestions contained therein, at a future session. The chair appointed Messrs. H. M. Whitney, C. Lewis Diehl, and H. R. Slack said committee.

President Remington resumed the chair, and Mr. Kennedy, Secretary of the Council, stated that in pursuance of a change in the by-laws regarding new members, a list of applicants for membership would be placed in a conspicuous place in the hall, so that it might be carefully examined and objections, if any, presented to the Council without delay.

Mr. Kennedy, as Secretary of the Council, read the minutes of that body since the last annual meeting, which were, on motion of Mr. Hallberg, duly approved. The minutes give the following information:

The Secretary presented the following items of business which had been disposed of by correspondence since the last session.

POTTSVILLE, PA., *October* 10, 1892.

Dear Sir: The Association having appropriated a sufficient sum of money to defray the necessary expenses of the committee of the Section on Commercial Interests for the prevention of cutting, the amount subject to the approval of the Council, it is moved by J. M. Maisch, seconded by H. M. Whelpley, that the bill certified by Chairman Torbert be paid, the amount being fifty-six $\frac{50}{100}$ dollars. Please send your vote to the undersigned.

Respectfully yours, GEORGE W. KENNEDY,
Secretary of Council.

Carried unanimously, Mr. Dohme not voting.

PHILADELPHIA, *October* 25, 1892.

To the Council of the American Pharmaceutical Association:

The following programme for the meetings of the various pharmaceutical bodies which are to meet in Chicago in 1893, is submitted for your approval. The programme presented is the result of considerable labor and care bestowed by the Local Committee, the Local Secretary, and the President of the American Pharmaceutical Association, the latter having visited Chicago for this purpose. Joint meetings were held on October 20, 21, and 22, and the subjects were thoroughly discussed. It is necessary to decide upon a programme at this time, in order to make the necessary preparations for the several meetings.

It will be noticed that on Tuesday, August 15, for the afternoon and evening sessions, two Sections will meet simultaneously. It is important for the satisfactory accomplishment of the business of the Association that this method be tried; it was believed that the Sections on Commercial Interests and Scientific Papers would be the best Sections to be paired, as the members of the Commercial Section are not so greatly interested in the work of the Section on Scientific Papers as they are in the labors of some other Sections and vice versa.

Owing to the attractions offered by the World's Fair and the other Congresses, the time spent in Chicago would be inconveniently long for most members if some means were not devised for accomplishing the work of the Association and still permitting members to visit the World's Fair. The meeting of the Sections simultaneously saves a whole day.

Will you please forward to the Secretary of the Council as soon as you can conveniently your approval or dissent of the plan proposed? In order to bring the matter before the Council properly, I move the adoption of the enclosed programme.

Very truly yours, JOSEPH P. REMINGTON.

Seconded by John M. Maisch.

PROGRAMME FOR MEETINGS OF AMERICAN PHARMACEUTICAL ASSOCIATION, WORLD'S CONGRESS OF PHARMACISTS AND INTERNATIONAL PHARMACEUTICAL CONGRESS FOR 1893.

Monday, August 14—10 a. m., Council Meeting; 3 p. m., First General Session; 8:30 p. m., Reception.

Tuesday, August 15—9 a. m., Second General Session; 3 p. m., Section on Commercial Interests, Section on Scientific Papers; 8 p. m., Section on Commercial Interests, Section on Scientific Papers.

Wednesday, August 16—Visit to the Exposition.

Thursday, August 17—9 a. m., Section on Scientific Papers; 3 p. m., Section on Education and Legislation; 8 p. m., Section on Education and Legislation.

Friday, August 18—Visit to the Exposition.

Saturday, August 19—9 a. m., Final Session; 3 p. m., Boat ride on the Lake.

Sunday, August 20—Rest.

Monday, August 21—10 a. m., World's Congress of Pharmacists; 8:30 p. m., Informal Reception.

Tuesday, August 22—10 a. m., International Pharmaceutical Congress.

Wednesday, August 23—10 a. m., International Pharmaceutical Congress; 8:30 p. m., Banquet.

Thursday, August 24—10 a. m., International Pharmaceutical Congress.

Yeas—Averill, Biroth, Conrath, Dohme, Goodman, Good, Kraemer, Maisch, Preston, Ramsperger, Remington, Sheppard, Watson, Whitney, Whelpley.

Nay—Fennel.

Not voting—Candidus.

Pottsville, Pa., Nov. 5, 1892.—It is moved by S. A. D. Sheppard, seconded by H. M. Whelpley, that a committee of three be appointed by the Chairman of the Council to consider the question of prizes, and report thereon to the Council previous to the next annual meeting of the Association.*

The above was carried by a unanimous vote, Mr. Candidus not voting.

The following was communicated under date of Nov. 18, 1892:

To the Chairman of the Council American Pharmaceutical Association:

Dr. Edward Kremers desires to continue his investigation on menthol and oil of pennyroyal, reported to the Association in 1887 and 1892. The undersigned committee, in compliance with Chapter VII. By-laws of the Council, respectfully recommend the appropriation of $50 (fifty dollars) from the Centennial Fund to Dr. Kremers, for the purchase of material to be used for the purpose stated.

Signed by the Committee on Centennial Fund,

Jos. P. Remington,
Chas. E. Dohme,
John M. Maisch.

H. M. Whelpley moves that Dr. Kremers be allowed the above mentioned sum for the purpose of continuing his investigations, which is seconded by Chas. T. P. Fennel.

St. Louis, Mo., *November* 28, 1892.

Carried unanimously, the seventeen members of the Council voting in favor.

Pottsville, Pa., *February* 3, 1893.

To the Council of the American Pharmaceutical Association:

It is moved by S. A. D. Sheppard, seconded by J. M. Maisch, that Prof. H. M. Whelpley be instructed to have 100 gold badges made, ready for delivery just previous to the next meeting of the Association at Chicago.

The motion was carried unanimously, Mr. Candidus not voting.

Chicago, *January* 28, 1893.

To the Members of the Council of the American Pharmaceutical Association, and of its Committee on the International Pharmaceutical Congress:

Professor Albert B. Prescott, as a member of the Committee on the International Pharmaceutical Congress, has moved, in the Committee:

"*That the Columbian World's Congress of Pharmacists and the International Pharmaceutical Congress be consolidated into one Congress, the same to be held under the joint auspices of the World's Congress Auxiliary and the American Pharmaceutical Association.*"

This motion is seconded by Mr. Albert E. Ebert, and is, therefore, hereby submitted to the committee for its decision, and, at the same time, to the Council of the American Pharmaceutical Association for its approval or rejection.

In order that the members may have before them, in a concise form, the main facts which might influence their judgment, I deem it necessary to make the following statement:

The World's Congress Auxiliary was created by the World's Columbian Exposition Authorities in 1890. Its object and present work is to arrange for the holding of World's Congresses of the representatives of the sciences, professions and pursuits of men. A large number of such congresses have been planned, and will be held. They

*The committee was appointed by the Chairman, December 15 (see page 15).

will be of a character befitting the celebration of the Columbian event. Among the congresses proposed, one was a congress of the Pharmacists, which, in conformity to the general plan, was called the Columbian World's Congress of Pharmacists. The World's Congress Auxiliary is an integral part of the official machinery of the World's Columbian Exposition, is provided with ample means to carry on its great work, and is recognized by the Government of the United States. The Directory of the Exposition has placed at the exclusive disposal of its Congress Auxiliary, a magnificent new building—the Art Palace—during the World's Fair season, for the use of the various congresses.

Each Congress in the series is of the broadest possible scope.

The undersigned was invited early in 1891 to accept the Chairmanship of the Pharmaceutical Committee of the Auxiliary. I accepted with the understanding that the co-operation of the American Pharmaceutical Association would be invited, and the American Pharmaceutical Association was formally invited at the New Orleans meeting to co-operate with the Auxiliary in making the preparations for the pharmacists' participation in this series of commemorative congresses.

Upon my advice the membership of the Pharmaceutical Committee of the Auxiliary was made up of members of the American Pharmaceutical Association, two of them being ex-presidents of that body.

The American Pharmaceutical Association, by its action at New Orleans, plainly indicated its intention to co-operate; but the form of its resolution on this subject rendered it impossible for the Chairman of the Committees to so rule, as the letter and spirit of that resolution did not agree.

As Chairman of the Committee on the World's Congress of Pharmacists, appointed by the Auxiliary, and as Chairman, also, of the Committee on the International Pharmaceutical Congress, appointed by the American Pharmaceutical Association six months later, I am greatly embarrassed by the confusion which seems to prevail relative to the two congresses. Had my original plan been adopted at New Orleans there would have been no difficulty, and I desire to add that the Council of the American Pharmaceutical Association at that time favored it, but the question was afterwards settled by the Association without any report *pro* or *con* from the Council.

The scope and object of the Columbian World's Congress of Pharmacists is broad and evidently most attractive, while the scope of the International Pharmaceutical Congress, as established by precedents, is narrow, uninviting, and nearly exhausted. (Please read editorial on pages 71 and 72 of the December number of *The Apothecary*.) Personally, I, of course, earnestly desire the greatest possible success for both Congresses, and I have done all I could do to remove any possible occasion for rivalry or conflict; but I can not remove the *confusion*.

The Auxiliary has shown the utmost courtesy and good feeling toward the American Pharmaceutical Association. It has tendered to it the use of splendid halls for the meetings of both the American Pharmaceutical Association and the International Pharmaceutical Congress, and the American Pharmaceutical Association has formally accepted its hospitality. It is still ready to accept the co-operation of the American Pharmaceutical Association, and willing that the two proposed Congresses shall be merged into one, the American Pharmaceutical Association to receive the fullest recognition in the matter.

It should be remembered in this connection that the Committee of the American Pharmaceutical Association includes all of the members of the Committee of the Auxiliary, and that the Pharmaceutical Advisory Council of the Auxiliary includes nearly every member of the Committee of the American Pharmaceutical Association, and that to consolidate the two Congresses would, in fact, simply insure the result evidently intended by both the Auxiliary and the American Pharmaceutical Association at New Orleans, which miscarried by technical errors.

It should further be borne in mind that this consolidation of the two Congresses virtually leaves the arrangement of all details with the Committee of the American Pharmaceutical Association, and that while the scope of the consolidated Congress is broadened very materially, the autonomy of the Seventh International Pharmaceutical Congress will not be in the least degree affected, as the programme can easily be so arranged that that body will have the power and opportunity to take complete charge of its own proceedings in its own way, and to organize as it sees fit.

What the Congress Auxiliary of the Exposition particularly desires is that the scope of the Congress shall be in harmony with that of its other Congresses, and broad enough to constitute it a memorial meeting, and thus its purpose can be accomplished by the programme arranged by the Committee without difficulty, and without complicating in any way the proceedings or their publication.

I, therefore, recommend that Prof. Prescott's motion be adopted by the Committee and approved by the Council.

Prompt action upon this question is of the utmost importance. If the consolidation is effected, the President and Permanent Secretary of the American Pharmaceutical Association should be requested to issue their invitation accordingly.

A suitable title for the Congress would be "The Columbian International Pharmaceutical Congress."

Respectfully submitted, OSCAR OLDBERG,
Chairman on International Pharmaceutical Congress.

Yeas—Averill, Good, Kraemer, Preston, Ramsperger, Sheppard, Watson, Whelpley, Whitney—9.

Nays—Biroth, Conrath, Dohme, Fennel, Maisch, Preston—6.

Not voting—Candidus, Remington—2.

To the Members of the Council of the American Pharmaceutical Association:

A motion will soon be presented to the Council for a vote, which is as follows:

"That the Columbian World's Congress of Pharmacists and the International Pharmaceutical Congress be consolidated into one Congress, the same to be held under the joint auspices of the World's Congress Auxiliary and the American Pharmaceutical Association."

While the co-operation of the World's Congress Auxiliary in the reception and entertainment of the Seventh International Pharmaceutical Congress is most desirable, the fact should not be overlooked that the Seventh International Pharmaceutical Congress has already been invited as the guest of the American Pharmaceutical Association to meet in Chicago.

This invitation cannot be withdrawn. A great deal of labor has been spent in the past few years to secure the right to the succession of International Pharmaceutical Congresses for America. There is a possibility that the succession and the right to call this the "Seventh" will be lost, and the work of the coming Congress may be ignored in the future. It is therefore resolved that the following motion be submitted for your vote:

"It is moved that in the event of the consolidation of the Columbian World's Congress of Pharmacists and the International Pharmaceutical Congress, this action shall not prevent the organization of the Seventh International Pharmaceutical Congress, as these have heretofore been carried out; that the autonomy of the Seventh International Pharmaceutical Congress shall not be affected, and that the title of the Congress, if consolidation be approved, be 'The International Pharmaceutical Congress.'"

JOSEPH P. REMINGTON.

Seconded by John M. Maisch.

Carried unanimously, Candidus not voting.

POTTSVILLE, PA., *May* 6, 1893.—It is moved by J. P. Remington, seconded by J. M. Maisch, that two bills for fifty-two dollars and fifty cents ($52.50) and forty-eight dollars and fifty cents ($48.50), for printing the programme and printing and engraving invitations for the International Pharmaceutical Congress to be held at Chicago, be paid out of the sum of $1,000 placed at the disposal of the Committee on the International Pharmaceutical Congress (see Proceedings 1892, page 49).

Carried unanimously, Remington not voting.

POTTSVILLE, PA., *May* 20, 1893.—It is moved by Jno. M. Maisch, seconded by C. T. P. Fennel, that the bill of Jos. P. Remington for one hundred and five dollars and forty-seven cents for the following items,

Postage	$71 80
Telegrams	9 67
Translations	8 50
Engraving	15 50
	$105 47

on account of the International Pharmaceutical Congress, be paid out of the $1,000 placed at the disposal of the committee.

The seventeen members of the Council voted in the affirmative.

POTTSVILLE, PA., *June* 1, 1893.—It is moved by S. A. D. Sheppard, seconded by H. M. Whelpley, that the Council appoint a committee, to consist of the President, Permanent Secretary and Chairman of Finance Committee, with power to act for the Council in the approval of bills for necessary expenses in connection with the International Pharmaceutical Congress, said bills, with those already approved by Council, not to exceed the appropriation of one thousand dollars, as per vote recorded on page 49 of 1892 Proceedings.

Carried unanimously, the seventeen members of the Council voting in favor.

On December 15, 1892, the Chairman of the Council appointed the following Committee on Prizes, viz.:

S. A. D. Sheppard, Adam Conrath, and Chas. T. P. Fennel.

On February 23, 1893, the Council appointed the following committee to audit the books and the records of the Treasurer, the Permanent Secretary, and the Chairman of the Council, viz.:

Charles E. Dohme, Charles Caspari, Jr.

On motion of C. T. P. Fennel, the above minutes were approved.

The Secretary presented 135 names for membership, the reading of which was omitted, as they would be posted in the meeting-room, according to the By-Laws (Chapter VIII., Art. II.).

The report of the Committee on Prizes was read, and on motion of Mr. S. P. Watson, adopted and referred to the Association for action; following is the report with resolutions attached:

REPORT OF THE COMMITTEE APPOINTED BY THE COUNCIL ON THE SUBJECT OF PRIZES.

Prof. J. M. Good, Chairman of Council of the American Pharmaceutical Association:

Dear Sir: The Special Committee appointed by the Council to consider the subject of Prizes would respectfully submit the following report:

The Committee advise the Council to recommend to the Association that the resolu-

tions in reference to Prizes passed in 1887, as found on page 506 of the Proceedings for 1887, and a copy of which accompanies this report, be rescinded, and that the following resolutions be adopted:

Resolved, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of $150.00, and apportioned as follows: $75.00 for the first, $50.00 for the second, and $25.00 for the third prize.

Resolved, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

Resolved, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper.

Signed, S. A. D. SHEPPARD,
CHAS. T. P. FENNEL,
ADAM CONRATH,
Committee.

Resolutions in reference to Prizes passed in 1887 as found on page 506 of the Proceedings for 1887;

Resolved, That the Association award annually three prizes for the three most practical papers read before the Scientific Section, aggregating the sum of $150.00, and apportioned as follows: $75.00 for the first, $50.00 for the second, and $25.00 for the third prize. The awards to consist of funds, apparatus, chemical or pharmacal literature, the choice to be optional with the winners; all essays or papers to be marked on title page, "For competition," so as to separate them from volunteer papers not offered in competition.

And further,

Resolved, That a committee of five be appointed, who shall decide upon the relative merits of such papers.

Mr. Kennedy read the following report, which was adopted and referred to the Association:

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Gentlemen: As Secretary of the Committee on Membership, in compliance with requirements of the Association, I herewith transmit my report for your consideration:

Immediately after adjournment of the Association at the last meeting, held in the White Mountains, N. H., an invitation was mailed to each one of those invited to complete their membership by signing a blank form of completion of membership, which was also mailed at the same time. Three hundred and ninety (390) gentlemen were recommended as proper persons to become members of our organization; of this number two hundred and eight (208), about fifty-one per cent., have made their membership good by signing the blank form and paying $5.00 for one year's dues in advance. Whilst the percentage of those recommended as having completed their membership is small compared with some other years, yet the number added to our rolls is the largest in any one year since I have held my present office, which dates back to the meeting held in Louisville, Ky., in 1874, where I was first elected. There was also an increase in membership by the addition of ten delegates, making a total increase of two hundred and eighteen (218), which number is credited to forty-one (41) States, two (2) Territories, District of

Columbia, and Canada. You will observe by this statement that nearly every State and Territory of our great country has contributed to this large accession. Since the publication of the Proceedings for 1892 the following seven invited gentlemen, whose names do not appear on the rolls, have completed their membership: John C. Lunberg, Chicago; Chas. L. Dittmer, Sioux Falls, S. D.; Robt. A. Rowlinski, Savannah, Ga.; H. A. Lyneman, Denver, Col.; John McCoy Eaton, Chicago; Americus O. McMichael, Des Moines, Ia.; Geo. A. N. King, St. Paul, Minn. The Treasurer has presented me with a list of 34 names of members who are in arrears for three or more years, and who are liable to be dropped from the rolls in case their indebtedness is not liquidated before the next volume of Proceedings is issued.

Report of Membership.

Members in good standing at last report	1396
Members elected since last report	208
Members received as delegates	10
Total Membership	1614

Loss in Membership.

By resignation	58	
By death	21	
Dropped from roll for various causes	42	
Total loss		121
Members in good standing at this report		1493

Honorary Membership.

Number on the roll at last report	21
Loss by death	2
Number on the roll at this report	19

I have thus briefly summarized the work of another year, with the exception of performing a sad duty of announcing the names of the departed with appropriate obituaries. In closing, I cannot but thank a kind Providence who has spared so many of us to continue in the labors of our profession for another year; and yet, while the angel of death has passed by us, He has taken from among us some with whom we have held a pleasant intercourse for a number of years, whose faces we gladly welcomed, and whose voices were gladly listened to in our counsels and deliberations.

The following list embraces the names of all deceased members since last meeting which came to the notice of your Secretary:

Leopold Babo, Boston, Mass.
Peter W. Bedford, New York City.
Joseph Bassett, Salem, N. J.
G. T. Chamberlain, St. Louis, Mo.
Dundas Dick, New York City.
D. R. Dyche, Chicago, Ill.
Stephen Goodrich, Hartford, Conn.
Chas. H. L. Hohenthal, New York City.
Parker P. Ink, Orlando, Fla.
Daniel S. Jones, Philadelphia.
Ewen C. Kennedy, Jersey City, N. J.
James J. O'Brien, Boston, Mass.
Henry Steele, San Francisco, Cal.
Wm. Strassel, Louisville, Ky.
Jno. J. Thomsen, Baltimore, Md.
Chas. M. Trask, White River Junction, Vt.
D. Vogt, Charleston, S. C.
Jos. R. Walton, Washington, D. C.
Jacob D. Wells, Cincinnati, O.
Lucien H. Wheeler, Waldo, Fla.
Archibald W. Wright, Philadelphia.
Dr. Christian Brunnengraeber, Rostock, Ger.
Dr. J. Leon Soubeiran, Montpellier, France.

Leopold Babo, of Boston, Mass., died there September 16, 1892. He was born March 19, 1823, at Rastadt, Grand Duchy of Baden, Germany. His parents moved early to Alt-Breisach, where his father was Collector of Customs. After studying there and at Müllheim, a neighboring town, he followed a six years' course in practical pharmacy at Freiburg and other cities, and afterwards at the University of Heidelberg. Among his teachers were Prof. R. W. Bunsen in chemistry, celebrated for his discovery of spectral analysis, Prof. G. W. Bischoff, celebrated in pharmaceutical botany, and Prof. J. R. Blum, for mineralogy. Mr. Babo's academical testimonials, dating from 1853, were of the highest kind. Deceased was an authority on pharmaceutical and chemical questions, declining formerly many honorable positions. He was a life member of our Association. Shortly after passing his "Staatsexamen" with high honors, he emigrated to this country. He was employed first with Eimer & Amend, in New York, in 1854, and started business for himself in Boston in 1855, in a small way, on Tremont street. His business increased considerably, and he was compelled to remove to a larger store, at No. 12 Boylston street; there his well known pharmacy was located for many years. Mr. Babo leaves a widow and three children, a daughter and two sons. Mr. Babo's ancestors were government officials, his grandfather, Johann Xaveries Babo, having been a counsellor of the Palatinate in 1784. The deceased became a member of our Association in 1859, at the meeting held in Boston.

Joseph Bassett, a well-known pharmacist, of Salem, New Jersey, died there after a brief illness. Deceased was a man highly honored and respected, and was very much interested in the advancement of his profession. He became a member of our Association in 1880, at Saratoga Springs, N. Y.

Peter W. Bedford, Ph. G., Professor Emeritus of the College of Pharmacy of the city of New York, and editor and founder of the *Pharmaceutical Record*, died on Wednesday, July 20, 1892, at the Profile House, White Mountains, N. H. Deceased was born in Johnsville, Dutchess co., N. Y., August 1, 1836. From early boyhood days he was given to study, and developed a natural liking for experiments in chemistry, and manifested a special aptitude for mastering the rudiments of that science. With the exception of a few years, Prof. Bedford resided all his lifetime in New York city. His early education was received at a private school, so that he was practically self-educated. In 1848 he was apprenticed to Mr. Fischer, who conducted a pharmacy on Bleecker street, and served his usual apprenticeship; he engaged with Mr. De la Vergne, and remained in his employment nearly two years; he next connected himself with Mr. E. McIntyre. Here he applied himself with great earnestness to the study of pharmacy, and recognizing early the value of systematic training in this and other branches of his profession, he lost no time in matriculating as a student at the New York College of Pharmacy, and after attending a regular course of lectures he passed a successful examination, securing the much-coveted degree of Ph. G. Shortly after being graduated from the New York College of Pharmacy, Prof. Bedford severed his connection with Mr. McIntyre and went into business on his own account. He opened a pharmacy at 769 Sixth avenue, with a branch at Mount Vernon, N. Y., and devoted his time in real earnest to the promotion of the welfare as well as progress of his profession. How well he accomplished this is written as a lasting memorial in the number of associations which he organized or of which he was a prime promoter. In 1860 he was chosen Secretary of the New York College of Pharmacy, which he held for ten years, until he became a trustee of the College. In 1870 he gave up both his retail stores and entered the wholesale drug house of Tarrant & Co., where he remained for two years, resigning to connect himself with the firm of Lazell, Marsh & Gardner. He was elected Professor of Pharmacy in the New York College of Pharmacy in 1873, and until the day of his death he was untiring in his efforts to promote the cause of pharmaceutical education and to urge upon pharmacists, young and old, the advantages to be derived from the cultivation of friendly and scientific

intercourse with each other. The organization of the New York State Pharmaceutical Association will be, in this connection, a lasting monument to his untiring energy and devotion to the best interests of the fraternity which he served so well. Numerous contributions were made by him to the pages of the *Druggists' Circular*, besides reporting the proceedings of our Association to the same periodical, which he did with regularity for a number of years. In the latter part of the year 1882 he assumed the editorial responsibility of *Martin's Chemists'* and *Druggists' Bulletin*, and in the beginning of 1883 severed his connection with Lazell, Marsh & Gardner, in order to devote increased attention to the general management of the journal. His first step on assuming the entire control of the *Bulletin* was to change its name to the *Pharmaceutical Record*, of which up to the time of his death he continued the editor. His many contributions to its pages are now matters of common knowledge to all connected with pharmacy. The Board of the city and county of New York underwent a reorganization in 1884, and Prof. Bedford was elected to serve three years. He was reëlected in 1887 to 1890 and in 1890 to 1893, and was Examiner in Pharmacy from the date of his election. On the occasion of his retirement, in 1891, from active duty as professor of pharmacy in the New York College of Pharmacy, he was made the recipient of a gold watch from the graduating class of that year. Deceased became a member of our Association in 1859, at Boston. In 1860, he was appointed a member of a committee of five to report on the progress of pharmacy; he was also elected Corresponding Secretary for that year, and in addition was selected to investigate and report on the relative value of chelidonium majus and sanguinaria canadensis as a source of sanguinaria, and in 1881 became president of our Association.

Guilford T. Chamberlain, of St. Louis, Mo., died at the residence of his son-in-law, H. P. Coniter, September 3, 1892, in Ferguson, Mo. Deceased was born in Silver Lake, Susquehanna Co., Pa., July 25, 1825. He moved with his parents to Warsaw, Ill., when about nine years of age. His father died soon after. At the age of fourteen he went to St. Louis, where he was engaged as a druggist's clerk, following the business nearly all the rest of his life. He was a self-made man. He started in business for himself in St. Louis, and continued up to 1882 at the N. E. corner 9th and Chambers street. He was always in the front ranks in pharmacy and its advancement. He held certificate No. 1 of the St. Louis Examining Board that was issued in 1874, immediately after the passage of the act. He was a man universally beloved, and will be greatly missed, not only in the community where he lived, but wherever he was known. Deceased was one of the oldest members of our Association, and was a life member. His membership dates back to the meeting held in Boston in 1853.

Dundas Dick, of New York city, died April 1, 1893, aged fifty-five years. Mr. Dick was born in Edinburgh, Scotland, where he received his early education in Heriot's Hospital, an institution founded in the sixteenth century, for the education of the sons of freemen of Edinburgh. After leaving this school he was apprenticed to an apothecary of his native city. During his apprenticeship he attended college and studied chemistry under Stephenson Macadams. Later, in 1861, he moved to Glasgow, and was employed as chemist by Dr. Ebenezer Milner. Three years subsequently he came to America, and began in a small way to build up what has since become a large businesss. About six years ago signs of paresis made themselves manifest in Mr. Dick, and he was no longer able to look after his business. He gradually sank, and finally passed away on the anniversary of his birthday. His was a generous and sympathetic nature, but so modest was he that his deeds of charity were seldom known to others than his beneficiaries. He was the donor of the microscopes for so many years presented as prizes in the College of Pharmacy of the city of New York. He was a member of the New York Pharmaceutical Association, as well as of various other trade, charitable, and industrial organizations. He was never married, and had no near relatives in this country. He became a member of our Association at Indianapolis, Ind., in 1879.

D. R. Dyche, whose name has been brought prominently before the attention of pharmacists through his position as committeeman of the International Pharmaceutical Congress and chairman of the Board of Trustees of the Northwestern University (Department of Pharmacy), Illinois, passed away at his home in Evanston, Ill., on Friday, August 4. The deceased had only been sick a few days. The immediate cause of death was septic meningitis, brought about by infection from a small carbuncle which appeared on his upper lip about ten days before his death. D. R. Dyche was of German descent, and was born on a farm near Lebanon, Warren County, O., March 11, 1827. When he was 14 years old, his father died, and after that time his education was shaped by his mother. He entered the Ohio Medical College when he was about 20 years old, and after graduating became an interne at a Cincinnati hospital. After practicing medicine for some time at Monroe, O., he moved to Chicago, where he took up the drug business of his brother, the late General Dyche, and gave it his sole attention. The establishment conducted at State and Randolph streets was one of the best known in the city. Although Dr. Dyche never distinguished himself by original research nor by contributions to pharmaceutical literature, he was nevertheless active and diligent in movements having for their object the betterment of pharmacy both in Chicago and the State of Illinois. His loss will be severely felt by his associates in the Sohool of Pharmacy of the Northwestern University, of which, as remarked above, he was a trustee, and not less so by Chicago pharmacists, among whom he was widely and favorably known. He was a man of considerable religious feeling, and was fearlessly honest in his opposition to fraud and wrongs. Dr. Dyche leaves a widow and two sons. One is William Dyche, associated with his father in the drug business, and a member of Evanston's city council. Another and younger son, George, is studying medicine. Deceased became a member of our Association last year, at the meeting held in the White Mountains, N. H.

Stephen Goodrich, of Hartford, Conn., died at his home of paralysis of the heart. The deceased was born in Simsbury, Conn., April 13, 1836. He went to Hartford at an early age, and began the study of pharmacy, after which he purchased the business place of Stephen G. Moses, comprising one of the largest prescription trades in the city. It was Mr. Goodrich's fortune to associate with himself in business young men of high promise, and as they have gone from his establishment they have taken leading places in business. He was a man who did good wherever he found the opportunity. His heart was actuated by the noblest motives. Kindness and generosity were the rule of his life. Many a man can recall the wholesome and manly co-operation which he has received from the hands of the deceased. He was one of the principal organizers of the State Pharmacy Board, and was at one time president of the Commission. He was also an original member of the Connecticut Pharmaceutical Association, and held the Presidency of the organization, serving in that capacity with marked success. It was mainly through his efficiency and leadership that the standard of pharmacy was elevated in his State. He became a member of our Association in 1875, at the meeting held in Boston.

Chas. H. L. Hohenthal, of New York city, died there September 6, 1890. Deceased was born at Koenigsberg, Prussia, March 2, 1821. He graduated from Berlin University in 1850 as a pharmacist, after which he practiced his profession in Potsdam, Germany; and later on removed to Manchester, and subsequently to London, England, where he was engaged in the leading pharmacies as prescription clerk. In 1860 he emigrated to this country, arriving in New York city, and immediately accepted a clerkship with Robert Wendler in Atlantic avenue, Brooklyn; and in 1861 began business for himself at 857 3rd avenue, New York. He was a member of the German Apothecaries' Association, the New York College of Pharmacy, German Liederkrantz, German Society of the City of New York, German Hospital Association, and many other organizations. Deceased was taken sick with perityphlitis, and died after one week's illness. He leaves a

wife and one son to mourn the loss of a good father and kind husband. Deceased united himself with our organization in the year 1865, at Boston.

Parker P. Ink, of Orlando, Fla., died there November 2, 1892, at the age of forty-five years. He served his apprenticeship to the drug business at Frederickton, Ohio, having previously received a good education at various schools. He graduated well up in his class at one of the pharmaceutical colleges. After receiving his diploma he commenced business at Washington, Ia., acting also at one time as salesman for several western firms. His health failing, he sold his store, which was well established, and moved to Florida about four years ago, and engaged in the cultivation of the grape. The mild climate proved beneficial to his health, until a few weeks before his death he was taken seriously ill with pulmonary consumption. Deceased won the respect and confidence of the people in the communities where he resided for his honesty and uprightness. His body was taken to Washington, Ia., for interment. He became a member of our Association in 1888, at the meeting held at Detroit, Mich.

Daniel S. Jones, one of the oldest druggists of Philadelphia, died May 12th, 1893, at his residence, southeast corner of Twelfth and Spruce Sts. He was born near Columbus, Ohio, November 13, 1822, and was educated at a boarding school at Burlington, N. J. He learned the apothecary business with Henry Zollickoffer, at Sixth and Pine Sts., Philadelphia, graduating from the College of Pharmacy with high honors; his graduating thesis on "Arum triphyllum," was published in the Journal of Pharmacy in 1843. In 1846, he began business for himself at 1201 Spruce street, where he continued until his death. He became a member of the Philadelphia College of Pharmacy in 1840, and took an active part in its welfare, participating in former years in the pharmaceutical meetings, and serving the College frequently on committees, and for many years as a member of the Board of Trustees. Mr. Jones was identified with several business corporations, principally coal companies, having been Treasurer and President of the Piedmont Coal and Iron Company, and President of the Bridgeport Coal Company. In 1847 he married Miss Elizabeth Osborne, who survives him, with a daughter, Miss Laura S. Deceased became a member of our Association in 1859, at the meeting held in Boston.

Ewen C. Kennedy, of Jersey City, N. J., died on Long Island, of softening of the brain, November 11, 1892. Mr. Kennedy was born and raised in the city of New York. After receiving a good common school education, he began the study of pharmacy by entering one of the retail drug stores of his native city. After receiving a thorough pharmaceutical training which completed his apprenticeship, he began business for himself in New York city, and continued for five years. He sold out and located in Jersey City, where he conducted several pharmacies for over twenty years. Through perseverance he amassed a fortune, which, however, he did not long enjoy. He was a person who took great pride in his business, and his whole aim was to obtain the best drugs that could be had. He was a man that gave of his large fortune considerable to the poor. He leaves a family to mourn the loss of a devoted husband and father. Mr. Kennedy became a member of our Association in 1888, at the meeting held in Detroit.

James J. O'Brien, of Boston, Mass., died at his home of pneumonia, after an illness of six days. Deceased was born March, 1843, in Boston, and attended the Quincy public school, after which he entered the drug store of the late Michael Gleason as an apprentice on Old Fort Hill, Boston; after serving a regular term, at the age of twenty he began business for himself at the corner of Kneeland and Hudson streets, in the year 1863, and continued in business at this location to the time of his death, about thirty years. Mr. O'Brien was considered a very careful pharmacist, and took much pride in advancing his profession, always ready to render such assistance as the good cause required. In 1875, at the meeting held in Boston, Mr. O'Brien became a member of our Association.

Henry Steele, of San Francisco, Cal., was born in the year 1819, in Allegheny Co., Pa. In 1838, he entered the drug store of Thomas Oliver, 10th and Walnut streets, Philadelphia, where he learned the apothecary business and remained with him twelve or thirteen years, leaving in 1851 to enter the Navy as apothecary. After four years service, he became tired of the monotony of sea life, and left it to enter the service of A. & B. D. Sands, New York city, in their wholesale department. From his experience there he thought he could better his condition by trying the wholesale business on his own account, and accordingly opened a store on Greenwich street, which he continued for five or six years; not being successful in this undertaking, he disposed of this store, and returned to the retail business, by entering as an assistant the established store of Mr. Olivier, a French pharmacist, on Broadway between 13th and 14th streets, New York city; but feeling rather disheartened by his failure, he determined to try a new field, and left New York for San Francisco, where he arrived in 1863, and was employed by B. B. Thayer, and his successors, Walker & Co. From the employ of Walker & Co. he went to W. J. Bryan, with whom he continued eighteen years. Mr. Bryan having disposed of his interest in the store of which Mr. Steele had charge, and the new proprietor not requiring his services, he next accepted a position with Mr. Gore, corner California and Fillmore streets, where he continued four years. But finding age creeping on him, and his health becoming broken, he accepted an easier position with Dr. Dodge, corner California and Devisadero streets, where his services were only required at the prescription department. In March, 1892, he received the appointment of apothecary at St. Luke's Hospital, San Francisco, but occupied the position only four days, being forced by illness to keep to his bed, where he lay six weeks, until the grim visitor Death summoned him in May, 1892, in his seventy-third year. He was of a reserved disposition about personal matters, but those who knew him speak kindly of his generous disposition and his deep sympathy for suffering humanity. Deceased was never married; he became a member of our Association in 1859, at the meeting held in Boston.

William Strassel, of Louisville, Ky., died January 3, 1892. Mr. Strassel was born August, 1848, and after receiving a good education, he began the study of pharmacy and located in Louisville, where he was engaged in the drug business almost continuously up to the time of his death, which was caused by a severe case of grippe, developing into pneumonia. Mr. Strassel, by those best acquainted with him, was considered one of the best pharmacists in the city where he resided; he took a great interest in the progress of pharmacy, and was very particular as to the quality of drugs he sold, handling the best obtainable. Deceased was married; two children and a wife survive him. Mr. Strassel became a member of our Association in 1870, at the meeting held in the city of Baltimore.

John J. Thomsen, one of Baltimore's leading wholesale druggists, on November 22, 1892, passed from among the living after a short illness, while on a visit to his daughter in New York city. The deceased was born in Baltimore on the 23d day of May, 1823, where his father had settled in 1807. After receiving a good education, he spent a year in an apothecary establishment, and subsequently two years in a large shipping establishment, both in Baltimore. The next six years of his life were spent in the employ of Messrs. G. and N. Popplein, wholesale druggists, of the same city, whereupon he established himself in the stearine candle business. His next step forward was his entry into the firm of Popplein and Orrick, wholesale druggists, as a partner, in the year 1846, which was succeeded by his purchase of Mr. Orrick's interest, and this by the retirement of Mr. Popplein in 1849. He then continued at the old stand, associating himself in 1856 with Messrs. G. D. Wood and Jno. Block, until Mr. Wood retired shortly after in 1858, when the business continued for twelve years under the name of Thomsen & Block. In 1871 Mr. Block retired, and Messrs. A. Lilly and Jno. Muth took his place

as partners in the business, which was styled Thomsen, Lilly & Co., and continued so until the year 1876, when Mr. Lilly retired, and the firm name changed to Thomsen and Muth. It is but a few years since (November 1, 1884,) that the Messrs. Muth retired from the firm and established themselves independently in this city (Baltimore). Mr. Thomsen's two sons, John J. and H. L., had in the meantime been associated in the business, which was henceforth styled Jno. J. Thomsen, and so remained until the day of his death. During this long and successful business career he has done much to extend and develop the wholesale drug trade of Baltimore, where he enjoyed the esteem and respect of the entire business community. On October 12, 1854, he married Miss Emma L. Lilly, the sister of his partner. He leaves a widow and four children: three sons and one daughter. The three sons having purchased the business from their father's estate, will continue the same as a wholesale drug business under the name of Jno. J. Thomsen's Sons, at the same location, 25 West Baltimore street. Deceased was one of the oldest members of our Association; his membership dates back to the meeting in Baltimore in 1856.

Charles M. Trask, M. D., White River Junction, Vt., was born in Brookfield, Vt., November 30, 1836, and died at White River Junction, June 28, 1891, from malarial poison. He began reading medicine with Dr. Carpenter at Burlington, took a course at Columbia College, New York, and subsequently at Dartmouth Medical College, Hanover, N. H. In 1865 he began the practice of medicine in Stewartstown, and in April of the same year was married. In the latter part of 1865, he removed to Welk River, where he practiced his profession for four years. He lost his wife by death in 1869. His health not being good, he sold his practice in 1871 and went to Boston, Mass., at which place he opened a pharmacy on Pleasant street, where he remained for ten years. His health continuing bad, he sold out and went to White River Junction, Vt.; at this place he went into business with C. L. Wilson, which partnership continued ten years. He was an honest man and very conscientious in every respect, and was highly esteemed by all who knew him. His great pride was in buying and selling pure drugs. Deceased became a member of our Association in 1875, at the meeting held in Boston, Mass.

D. Vogt, of Charleston, S. C., died at his home November 2, 1892. He was forty-seven years old, and had been a sufferer from Bright's disease for some time previous to his death. Mr. Vogt was born in Bremen, Germany, and came to this country at an early age. He was an active member of the South Carolina Pharmaceutical Association. Those best acquainted with the deceased speak of him as a man of high culture, good to the poor, very honorable in all his business transactions, and highly respected by the citizens of Charleston. He was a well-known member of our Association, having attended every annual meeting since his election in 1889 at San Francisco, Cal.

Joseph R. Walton, of Washington, D. C., was born in Halifax, England, June 6, 1846, where his youth and school days were spent. He completed his school education at the Park Academy of that place, after which he became engaged in business. He remained in business until 1870, when he left England to seek a home and fortune in the United States. He received an appointment in the United States Signal Service and Weather Bureau shortly after his arrival here, and in this position showed great ability and proficiency in scientific work. The accuracy that he acquired in tracing ocean storms gained for him complimentary notices from European scientific journals. In 1875, he commenced the study of medicine, but before completing his studies he engaged in the drug business in Washington, D. C., where he continued until his death. He entered the College of Pharmacy in 1880, and graduated from that institution in 1882, after which he resumed his medical studies, graduating from the Medical Department of the Columbia University and receiving the degree of M. D. in 1884; he became a member of the National College of Pharmacy soon after his graduation, and in April, 1884, was elected to the Chair of Analytical Chemistry, which he filled to the time of his

death with honor to himself and credit to the institution. He served several years as one of the trustees of the College, and as Secretary; he was elected President at the last annual meeting of the College, held in April, 1892, and was fulfilling the duties of this office at the time of his death. In March, 1878, he was married to Miss Bessie Ridgely, of Baltimore, Md. Prof. Walton was a constant student, zealous and progressive in his profession; as a man, he was honorable and conscientious, beloved by those who knew him well, and had the respect of all. He was a member of the Board of Pharmacy of the District of Columbia. His membership in our Association dates from 1883, at the meeting held in Washington, D. C.

Jacob D. Wells died February 18, 1893, at his residence, corner of Fourth and Central Avenue, Cincinnati, Ohio. Since 1859 he has had a business place in that vicinity. His illness was acute chronic bronchitis, and he had been a patient sufferer since May, 1892, his health having been on the wane, however, ever since the death of his wife, five years ago. Her death caused him a great deal of sorrow, as she had been for many years a loving helpmate. Deceased was born fifty-seven years ago on a farm near Marion, Ohio. He had but a country school-house education, when at the age of fourteen he tired of dull farm life and set out for the city of Cincinnati to seek his fortune. His first employment was in a drug store kept by J. M. Brown, at Fourth and Walnut. Meantime he saved money enough to gain a better education at College Hill, and then, in 1859, opened a drug store for himself on the corner where the Grand Hotel now stands. He remained there until 1865, when he purchased the property where his store now stands, and built the four-story structure. His store has become a Cincinnati landmark, and he was probably the best known man in the neighborhood. He was married in 1860 to Miss E. J. Coon, the daughter of George Coon, who was for years a well known distiller of Cincinnati. Four orphaned children survive, namely, Albert, Etta, Emma, and Harry. The oldest, Albert, will probably carry on the business. The deceased was a public-spirited man, having served in Council, also in the Board of Aldermen in 1874; was a member of the School Board and University Trustee. In 1874 he was President of the Cincinnati College of Pharmacy. At the meeting held in Cincinnati in 1864 deceased became a member of our Association.

Lucien H. Wheeler, of Florida, was born in West Galway, Fulton Co., New York, in the year 1810. At the age of sixteen he went to New York city, and began the study of pharmacy. After completing his education he began business for himself, and later on was actively engaged for many years under the firm name of Wheeler & Hart and L. H. & G. H. Wheeler, and lastly of Wheeler, Patterson & Co., from which he retired about eighteen years ago. Deceased died in Florida, June 19, 1889. His membership in our Association dates from the meeting held in Washington, D. C., 1858.

Archibald W. Wright was born in Philadelphia, Pa., on August 24, 1829, and died December 21, 1891, at the age of sixty-two years. After receiving a good Latin and Greek education in Philadelphia, he entered Dickinson College at Carlisle, Pa., at the age of fourteen years, graduating with honors after taking a full course. He returned to Philadelphia and began the study of medicine, entering the University of Pennsylvania as a student, with Dr. McClintick as preceptor, and from which institution he graduated. He practiced medicine in Memphis, Tenn., for several years, and subsequently in his native city. In January, 1867, Dr. Wright opened a drug store at the corner of Eighth and Wharton streets. In 1870 he purchased the drug house at Front and Market streets, where he carried on the drug business for twenty-two years, removing in the fall of 1891 to 122 Market street. Deceased became a member of our Association in 1868, at the meeting held in the city of Philadelphia.

Rudolf Johann Christian Brunnengraeber died at Rostock, Germany, February 19, in the sixty-first year of his age. He was born in Schwerin, May 19, 1832, and after attending there the classical school (gymnasium) until 1849, became an apprentice in phar-

macy in Berlin, where he subsequently continued his studies at the University to prepare for the State's examination, which he passed at the University of Rostock, at which institution he afterward, in 1862, graduated as Ph. D. In the same city he became the proprietor of a pharmacy in 1859, and combined with the business the manufacture of various chemicals. He took a most prominent part in pharmaceutical affairs in Germany and in the welfare of the National Apothecaries' Society, of which he became one of the directors in 1869, and continued in that position until the time of his death, serving as president from 1878 until 1891. For thirteen years he was a member of the Board of Health of the German empire, and he served in many other positions of honor, trust and responsibility. He was first vice-president at the Fifth International Pharmaceutical Congress, held in London in 1881, and in the following year he was elected an honorary member of our Association at the meeting held at Niagara Falls, N. Y.

Professor Jean Leon Soubeiran died at Montpellier, France, December 15, 1892, at the age of 65 years. He was born in Paris, November 27, 1827, and received his scientific training at the pharmacy school in the same city, where his father, Eugene Soubeiran, was professor of pharmacy. The deceased graduated from this school in 1853 and 1854, the subjects of his theses on these occasions being "micrographic studies on some starches" and "on the application of botany in pharmacy." He devoted much attention to botany, zoology, and geology, and to natural sciences in general; but particularly to materia medica. In former years he wrote valuable essays on cinchona bark, rhubarb, mastic, catechu, isinglass, cod liver oil, etc., and was the author of a creditable work on falsifications and adulterations of alimentary and medicinal substances and other products. In 1873, he was called to the Chair of Pharmacy in the École Supérieure connected with the Montpellier University, which position he held at the time of his death. He was for many years a member of the Committee entrusted with the publication of the Journal de Pharmacie et de Chimie. The scientific labors of the deceased were valued at home and abroad, and he was elected correspondent or honorary member by many societies. Among others he was an honorary member of the Philadelphia College of Pharmacy, and was elected an honorary member of our Association at the meeting held in St. Louis, Mo., in 1871.

In concluding this report, your Secretary desires to return his thanks to all officers and members of the Association for valuable assistance rendered whenever called upon, which necessarily made the duties comparatively light and much more pleasant. I would also request members to inform the undersigned whenever they hear of the demise of any member.

All of which is respectfully submitted,

GEO. W. KENNEDY,
Secretary of the Committee on Membership.

Mr. Dohme, Chairman of the Auditing Committee, read the following report, which was adopted and referred to the Association.

BALTIMORE, *July* 18, 1893.

To the Council of the American Pharmaceutical Association:

The undersigned, a Committee appointed by the Council for the purpose of examining the books and accounts of the Treasurer, the Permanent Secretary, and Chairman of the Council, have performed the duties assigned them, and have found all entries correct, and the disbursements to correspond with the vouchers.

CHARLES E. DOHME, *Chairman.*
CHARLES CASPARI, JR.
DAVID M. R. CULBRETH, M. D.

The Chairman appointed the following Committee on Credentials, who were to report directly to the Association, viz.: Messrs. Fennel, Watson, and Goodman.

H. M. Whelpley read the Treasurer's report, which was accepted and referred to the Association.

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1892, TO JULY 1, 1893.

RECEIPTS.

Cash on hand July 1, 1892		$3,703 25
Received from the sale of 23 Certificates @ $5.00		115 00
Received from the sale of 19 Certificates @ $7.50		142 50
Received from the sale of Proceedings		187 73
Received from the sale of Badges		306 50
Received for Interest on Deposit in New England Trust Company, Boston		141 86
Received for Interest on Money Invested in Bonds, (General Fund)		150 00
Received from Local Committee of Arrangements		420 04
Received from Transportation Committee amount of Rebate from Railroads		18 00
Received from Ebert Fund		24 00
Received from Centennial Fund		50 00
Received for Life Membership Fees, viz.:		
James A. Lee	$10 00	
Edwin M. Boring	30 00	
Jonas Winter	20 00	
		60 00
Received for Annual Fees 1889	$10 00	
Received for Annual Fees 1890	55 00	
Received for Annual Fees 1891	95 00	
Received for Annual Fees 1892	3,920 00	
Received for Annual Fees 1893	2,220 00	
		6,300 00
Received from sale of National Formulary		548 07
		$12,166 95

DISBURSEMENTS.

1892.				
July	18.	Check 299.	S. A. D. Sheppard, sundry expenses	$22 02
	18.	Check 300.	John Dickson & Co., Proceedings	9 50
	18.	Check 301.	H. M. Whelpley, printing and stationery	15 65
	18.	Check 302.	Charles Rice, salary 1891 to 1892	30 00
	18.	Check 303.	John M. Maisch, traveling expenses	49 04
	18.	Check 304.	W. E. Carson, stenographer	20 00
August	8.	Check 305.	Neil Satterlee, Section on Education and Legislation	6 00
	8.	Check 306.	Standard Publishing Company, printing and stationery	30 00
	8.	Check 307.	Wickersham Printing Company, National Formulary $9 82; Proceedings 18 75	28 57
	8.	Check 308.	S. A. D. Sheppard, traveling expenses	31 44
August	23.	Check 309.	W. E. Carson, stenographer	100 00
	23.	Check 310.	H. R. Grassmann, printing and stationery	15 00
	26.	Check 311.	Geo. J. Seabury, Committee on Transportation	130 33
	26.	Check 312.	Winkley, Dresser & Co., printing and stationery	63 25
	27.	Check 313.	Carl S. N. Hallberg, Section on Scientific Papers	17 75

August	30.	Check 314. Joseph P. Remington, Committee on Metric System		$18 63
September	1.	Check 315. L. C. Hogan, Section on Legislation and Education		4 74
	1.	Check 316. W. H. Torbert, Section on Commercial Interests		4 99
	1.	Check 317. John U. Lloyd, Ebert Prize		24 00
	1.	Check 318. Chas. T. P. Fennel, 1st Prize Award		75 00
	1.	Check 319. Harry Vin Arny, Second Prize Award		50 00
	1.	Check 320. Charles Rice, Balance of Salary, 1891 to 1892.		250 00
		Check 321. Not used.		
	16.	Check 322. Wickersham Printing Company, National Formulary		105 00
October	12.	Check 323. Chicago Daily Call, Section on Education		5 25
	20.	Check 324. Arthur Bassett, Section on Commercial Interests		56 50
	29.	Check 325. Wickersham Printing Company, Proceedings		514 06
November	11.	Check 326. Standard Publishing Company, printing and stationery		9 00
	30.	Check 327. John M. Maisch, Proceedings	42 35	
		National Formulary	11 42	
				53 77
December	8.	Check 328. Palmer, Winall & Co., Section on Commercial Interests		26 50
	15.	Check 329. Wickersham Printing Company, Proceedings		726 12
	15.	Check 330. Winkley, Dresser & Co., printing and stationery		30 50
December	17.	Check 331. Edward Kremers, Centennial Fund		50 00
	21.	Check 332. Standard Publishing Company, printing and stationery		6 00
1893.				
January	9.	Check 333. Wickersham Printing Company. National Formulary	9 51	
		Proceedings	4 03	
				13 54
	9.	Check 334. S. A. D. Sheppard & Co., sundry expenses		21 10
	19.	Check 335. John M. Maisch, Journals for Reporter on Progress of Pharmacy		12 38
	28.	Check 336. C. Lewis Diehl, Committee on National Formulary		16 70
February	9.	Check 337. Wickersham Printing Company, National Formulary	$106 40	
	9.	Printing and stationery	4 50	
				110 90
	9.	Check 338. H. R. Grassmann, printing and stationery		6 50
	15.	Check 339. Winkley, Dresser & Co., printing and stationery		58 10
March	4.	Check 340. Geo. W. Kennedy, one-half year's salary as Secretary of Committee on Membership	$75 00	
		One-half year's salary as Secretary of Council 1892–1893	25 00	
				100 00
	4.	Check 341. Henry Kraemer, one-half year's salary as Reporter on Progress of Pharmacy 1892–1893		375 00
	4.	Check 342. S. A. D. Sheppard, one-half year's salary as Treasurer, 1892–1893		375 00

March	4.	Check 343. John M. Maisch, one-half year's salary as Permanent Secretary 1892–1893		$375 00
April	4.	Check 344. American Surety Company, premium on Treasurer's bond		25 00
	10.	Check 345. Wickersham Printing Company, Proceedings	$2052 33	
		Expressage and postage	437 90	
		National Formulary	5 53	
				2495 76
	10.	Check 346. H. R. Grassmann, printing and stationery		15 75
	17.	Check 347. Standard Publishing Company, printing and stationery		25 00
	19.	Check 348. Winkley, Dresser & Co., printing and stationery		69 00
May	1.	Check 349. J. B. Lippincott Company, International Pharmaceutical Congress		52 50
	1.	Check 350. Breuker & Kessler, International Pharmaceutical Congress		48 50
	25.	Check 351. John M. Maisch, Insurance		36 00
	29.	Check 352. Joseph P. Remington, International Pharmaceutical Congress		105 47
1892.				
July	13.	Life Membership Fund		10 00
	25.	" "		30 00
1893.				
April	7.	" "		20 00
		Total		$6975 81

SUMMARY OF DISBURSEMENTS.

July 1, 1892, to July 1, 1893.

Proceedings. Checks 300, 307, 325, 327, 329, 333, 345	$3,805 04
Stenographer	120 00
Journals for Reporter on Progress of Pharmacy	12 38
Salaries, Balance of the year 1891–1892	280 00
Salaries, first half of the year 1892–1893	1,225 00
Premium on Treasurer's Bond	25 00
Travelling Expenses	80 48
Section on Scientific Papers	17 75
Section on Education and Legislation	15 99
Section on Commercial Interests	87 99
Committee on Transportation	130 33
Committee on Metric System	18 63
International Pharmaceutical Congress	206 47
Printing and Stationery	348 25
Insurance	36 00
Miscellaneous Expenses	43 12
General Prizes	125 00
Total amount paid out for Current Expenses	$6,577 43
Ebert Prize	24 00
Centennial Fund	50 00
Life Membership Fund	60 00
National Formulary	264 38
Total amount of Disbursements	$6,975 81
Cash on hand, July 1, 1893	5,191 14
	$12,166 95

Of the cash in the Treasury the sum of $721.31 belongs to the account of the Committee on Arrangements, as per following statement:

ACCOUNT OF COMMITTEE ON ARRANGEMENTS.

1892.			
July	1.	Cash on hand	$285 39
September	6.	Cash received from the Local Committee on Entertainment, Boston, Mass.; being surplus left in their hands after the Annual Meeting of the Association in July, 1892	420 04
1893.			
July	1.	Interest to date	15 88
			$721 31

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll at the next annual meeting, there is now outstanding on the books of the Association:

Annual Dues for 1892	$310 00
Annual Dues for 1893	4,325 00
	$4,635 00

Respectfully submitted,

S. A. D. SHEPPARD,
Treasurer.

Complaint having been made that the present programme does not allow sufficient time to the Section on Legislation and Education, on motion of Mr. Sheppard the chairman appointed a committee of three to rearrange it. The committee consisted of Messrs. Sheppard, Dohme, and Kraemer.

J. P. Remington stated that owing to the absence of the Permanent Secretary it would become necessary for the President to appoint a Recording Secretary *pro tem.* (according to the By-Laws, Chap. I., Art. II.), and announced his intention of appointing H. M. Whelpley to the position.

Mr. Zwick moved that the Chair be requested to appoint a committee of three to frame a resolution expressing the deep sympathy of the Association with Professor John M. Maisch in his present serious illness, and to express also the deep regret experienced at his absence and the loss of his valuable services as Permanent Secretary at this meeting. The motion was duly seconded and carried. The Chair appointed Messrs. Frederick Hoffmann, G. A. Zwick, and A. E. Ebert.

PRESIDENT REMINGTON: It is now the duty of your President to present to you a gentleman who is known all over the world in pharmaceutical circles, and whose presence at this meeting is certainly a very pleasant surprise. I refer to Mr. Michael Carteighe, President of the Pharmaceutical Society of Great Britain, whom I now have the pleasure of introducing to the American Pharmaceutical Association, and who will say a few words upon this occasion.

MR. CARTEIGHE: *Mr. President, Ladies and Gentlemen:* I confess that I am not a little disappointed at this moment by the announcement just made that Professor Maisch is unable to be present. I have a special reason for this, because I had conceived a little surprise for him. I am not quite sure whether I have not traveled faster than the mails, and that what I have to say may be news to you, but I happen to have in my pocket a

gold medal, the Hanbury medal, which has been awarded to Professor Maisch (applause). This medal, you may remember, gentlemen, is awarded biennially only. It was founded in honor of the late Daniel Hanbury, of England, is international in its character, and is not limited to any part of the world. It is not open to competition, it is open to no examination, but the award is effected by a process of selection, and is made by the officers of the principal Societies in Great Britain. Under the terms of the trust-deed those officers are the President of the Chemical Society for the time being, the President of the Linnæan Society, the President of the Pharmaceutical Society of Great Britain, the President of the British Pharmaceutical Conference, and one pharmaceutical chemist nominated by the two pharmaceutical Presidents. Well, as a result of their deliberations a fortnight ago, and under previous sittings, the award, as I have already stated, has been made; and while I feel that officially, perhaps, it would be wrong for me to have made this announcement to you, sir, and to the members of the Association, yet under the circumstances I felt that it would be the proper thing for me to do, and I could not help referring to it in this manner. In awarding this medal to Professor Maisch, the fact of his work was well and carefully considered. You know the work for which this medal is awarded is high excellence in the chemistry and natural history of drugs, in the widest sense of the term, the sort of work that Hanbury used to do, and it would be presumptuous in me to make any reference to the merits entitling Professor Maisch to receive this award. All that I can say in regard to him is that he is a fit successor to the many distinguished men to whom that award has been made in the past—Flückiger, in the first instance, then Dragendorff, John Elliot Howard, Dymock, Planchon, Hesse, and lastly to Professor Maisch. These men, I think you will admit, are men of very great distinction. In making this award of the Trustees, I am charged by the Council of the Pharmaceutical Society of Great Britain, and by all its members, to convey to Professor Maisch the congratulations, hearty and sincere, of all its members upon the occasion of this award to a distinguished American pharmacist. (Applause.) The instructions that I carry with me are, that this medal is to be awarded by the President of the International Pharmaceutical Congress at its meeting next week.

Well, sir, putting aside this one touch of sadness in our meeting, allow me to say that I attend here to-day, and that two of my colleagues are coming after me as fast as they can, thus making three members of the Council of the Pharmaceutical Society of Great Britain who will be present, the other two being Mr. Martin, of Newcastle, and Mr. Martindale, of London. We come not only to attend the meeting of the American Pharmaceutical Association and the special World's Congress, but come also to express, in the heartiest manner, our cordial sympathy from the old country toward you in the new, and to express our admiration for the work which you are doing. You, gentlemen, and we in Great Britain, represent pharmacy so differently and so distinctly from the way it is represented on the continent of Europe, and in all the older countries, that we are, as it were, tied together specially to consider how best to advance our calling by mutual, voluntary efforts, rather than by stated ends. You know that you and ourselves have to do our work through co-operation, through corporate bodies and associations, and do our work without any subsidy from our governments. We have to encourage our young men to qualify themselves without the government itself taking, in most cases, a very active part, and I am not prepared to say that either you or ourselves have been wholly unsuccessful. It may be a question whether the continental system, where government, as a rule, gives help, is not the better one; but whether or not, I am perfectly certain that in the body I represent, and in the body that you now represent, there is that liking and that desire for free action, uncontrolled by State, that would make us at present hesitate to adopt the continental system.

Pharmacy, as you have hinted in your address, although very eloquently coupled with other matters, is not a calling in which we expect to get rich, and I don't suppose that

any of us ever contemplated when we entered it, or our parents before us, that we should become rich—if they did, they were foolish—but we have a right to believe, and I think we have reason to hope, that good qualifications and proper training and education on the part of the individual being possessed, both we in the old country and you in the new may hope to get a living in the present state of the world, and that is something to be thought of. At any rate, in the old country, we only contemplate that at the present time. Of course, I am aware that in this great country you Americans do outstrip the universe, both in pharmacy and in many respects besides, and also in the acquisition of immense fortunes. On the other hand, I don't know—possibly it is my ignorance—that any pharmacist in the United States, or any number of them, have acquired or are likely to acquire from pharmacy what people popularly call a fortune, and I'm not sorry that it is so. The business or profession of pharmacy is one that, if it is worth anything, is worth working at. The man who complains of his pharmacy and of his fate I have always found to be a man who does not keep himself abreast of the work that is going on. The man who considers that education is not a power and that it doesn't mean money—I hold that it does—and the man who would carry on his business as a butcher does, as an ordinary trade, and who would, at the same time, demand from the public professional remuneration for the things which he sells, is not likely to get the respect of the public. It is true that we are under great difficulties on both sides of the Atlantic, for while in Great Britain pharmacy has spread not from above downward, but from the old medicine woman has been originated the dispensing of medicine (and in many respects it has been the same in the United States), yet in the old continental countries, on the contrary, the dispensing of medicine came down from the professional classes. Well, that being so, we have in our respective countries to deal with a class of the public who imagine that any one can prescribe for them and that any one can compound their medicines. This is the natural condition of things until they become educated, and it has taken us a long time in Great Britain to get the better educated portions of the community, not pharmacists, to realize that this is not the case. You, I believe, in the large cities are doing that and have done that part successfully; and one great advantage which you have over us, one for which I envy you, is the arrangement for an enforced curriculum that you have in most of your States, and the excellent opportunities you have for education, not only in Chicago where I observe them, having read full descriptions of the new college laboratories, but in all the principal cities I have seen, with great satisfaction, and I shall watch with interest in the old country, this desire to give the best and highest education. What is wanted in pharmacy, as the President has said, is not that every pharmacist should be a highly trained and highly skilled synthetical and analytical chemist—there are many men who are so, but that is not absolutely necessary or even essential—but it is necessary and essential that every pharmacist should know something of the methods by which the weapons he uses in the cure of disease, and under the advice of the physician, are constructed, and to be able to ascertain by proper chemical processes that they are what they profess to be. If every man so educated insists, in his own immediate neighborhood, that proper remuneration for his services shall be given, I believe that in Great Britain and in the United States before long the public will respect every one of us, and will pay us for our services professionally.

Mr. President, once more let me thank you for the opportunity you have given me to address a few words to your Association, and, lastly, let me in person thank the Council of the Association and the members for the honor they conferred upon me many years ago in making me an honorary member. I feel it is a privilege and pleasure for me to be here to-day, to thank you for it personally. (Applause.)

PRESIDENT REMINGTON: I take pleasure in announcing that among other delegations present on this occasion, there is one from the National Wholesale Druggists' Association, which comes to us with words of good cheer. I am sure you will all be glad to hear from Mr. Lord, of Chicago, the chairman of that delegation.

MR. LORD: Mr. President, Ladies and Gentlemen: It is with very much pleasure and no little pride that we appear before you as delegates from the National Wholesale Druggists' Association, to express from the members of that body their greetings and the sympathy and kindly sentiments which they feel towards this kindred Association here assembled. We congratulate you upon the progress which you have made in elevating your profession to the high plane of merit and usefulness which it has attained. We also congratulate you upon being the ablest, largest and oldest pharmaceutical association upon this continent. We have no intention, gentlemen, of inflicting a long speech upon you; we simply come to extend to each one of you the cordial greetings of the Association we represent, to offer our sincere wishes that your deliberations here may be attended with harmony and meet with success, and to express the hope that you may greatly enjoy the provisions which we understand have been made for your entertainment. I thank you, gentlemen, for your kind attention, and once more bid you God-speed. (Applause.)

PRESIDENT REMINGTON: I am sure that I express the sentiments of this Association when I say to the gentlemen who have favored us with their kind words of encouragement on this occasion, that we extend our heartfelt thanks to them, not only for their presence here, but also for their eloquent addresses. I am sure that, in the name of the Association, I can bid them welcome to our meetings, and take pleasure in according to them the privileges of the floor, so that they may, at any time, favor us with such communications as they may desire to present.

I am glad to be able to announce to the Association at this time that among our foreign visitors now present are Dr. Egger, of Vienna, Mr. Morten Neygaard, of Christiania, Norway, and Dr. Ramlot, of Brussels. I have been pleased to invite these gentlemen upon the platform. I may add that I shall consider it a personal favor if any members, upon seeing other foreign delegates enter the hall, will introduce them to the Chairman of the Committee on Membership, so that they may be introduced, in turn, to the Association. I will also make another request, which is, that each member constitute himself a representative of the Committee on Entertainment, for by following this course I believe that we shall be able to make these gentlemen feel thoroughly at home, besides receiving great benefit from their counsel and interchange of ideas.

Mr. Fennel presented the following resolution:

Resolved, That the American Pharmaceutical Association extend to Dr. Rice and the associate members of the Committee on Revision a vote of thanks for the presentation of the United States Pharmacopœia to American pharmacists; and that the members of the American Pharmaceutical Association hereby pledge themselves to indorse the sentiments expressed by President Remington to make the United States Pharmacopœia the standard work for pharmacists from Maine and California to Florida.

This resolution was seconded and unanimously adopted.

A recess of five minutes was here taken in order that members from the different states might select a Nominating Committee, when, upon reassembling, the following members were appointed from the states named:

Alabama—P. C. Candidus, J. J. McAfee.
Arkansas—W. L. Dewoody, E. E. Shendel.
Colorado—J. W. Turrell, C. M. Ford.
District of Columbia—W. S. Thompson, S. L. Hilton.
Florida—S. P. Watson, Mr. Woodman.
Georgia—Paul Penniston, W. R. Cornell.
Indiana—L. Eliel, G. W. Sloan.
Illinois—C. S. N. Hallberg, H. W. Martin.
Iowa—R. Upson, G. H. Schafer.
Kansas—Mrs. M. O. Miner, L. E. Sayre.
Kentucky—G. A. Zwick, W. H. Averill.

Louisiana—A. L. Metz, Mr. Breslin.
Maryland—L. Dohme, Wm. Simon.
Massachusetts—C. H. Price, F. H. Butler.
Michigan—J. Vernor, G. Gundrum.
Mississippi—J. C. Means.
Missouri—J. M. Good, H. M. Pettit.
Nebraska—Mr. Goodman, Mrs. J. M. Crissey.
New Hampshire—A. P. Preston.
New Jersey—Wm. C. Alpers.
New York—L. F. Stevens, J. Pfeiffer.
North Carolina—R. Simpson, Mr. Charis.
Ohio—L. C. Hopp, J. U. Lloyd.
Oregon—C. C. Blakely.
Pennsylvania—S. W. Heinitsh, Wm. McIntyre.
Tennessee—A. A. Yeager, J. O. Burge.
Virginia—W. E. Church.
Wisconsin—E. Kremers.
West Virginia—Mr. Bocking.
Quebec—S. Lachance, E. Muir.

And from the Association at large, Messrs. Patton, Ebert, Whelpley, Whitney and Trimble.

President Remington appointed as a committee on time and place of next meeting, to report at the second session: Messrs. S. A. D. Sheppard, Chas. M. Ford, H. M. Whelpley, Leo Eliel and T. H. Patterson.

Mr. J. M. Good presented the following report of the committee appointed to visit the American Medical Association:

REPORT OF THE DELEGATION TO THE AMERICAN MEDICAL ASSOCIATION, SECTION OF MATERIA MEDICA AND PHARMACY.

Your delegation, appointed by President Remington to attend the meeting of the American Medical Association, Section of Materia Medica and Pharmacy, held in the city of Milwaukee, June 6 to 9, 1893, beg leave to submit the following report:

Beside the chairman of the delegation, the following members were able to be present at the sessions: C. Lewis Diehl, Frank G. Ryan, John N. Hurty, A. H. Hollister, John A. Dadd and Adam Conrath.

Prof. E. L. Patch, of Boston, although unable to attend, sent an interesting and instructive paper.

The following papers were presented and discussed:

1. Scientifically Prepared Remedies Essential to Rational Therapeutics, Frank Woodbury, Philadelphia, Pa.
2. The Waters of Glen Springs, Watkins Glen, N. Y., F. E. Stewart, Watkins, N. Y.
3. Shall the Practice of Medicine and the Practice of Pharmacy continue Distinct and Separate? J. M. Good, St. Louis.
4. The Physician and the Pharmacist, L. Ch. Boisliniere, St. Louis.
5. The National Formulary, C. Lewis Diehl, Louisville.
6. Incompatibles and Some Prescription Controversies, Edgar L. Patch, Boston.
7. A Paper on Cocillana, Frank G. Ryan, Philadelphia.

Other papers were promised the chairman, Dr. Woodbury, which when received would be published in the Journal of the Association and credited to this Section. Your delegates are of the opinion that this Section of Materia Medica and Pharmacy deserves to be cultivated, for the good which is likely to come of it for both professions interested.

Some extra effort is needed in order to popularize it. The present officers, with the aid which this Association is able to render, are ready for the effort.

In this direction, papers, with specimens for demonstration and illustration, are invited for the next meeting, bearing in mind, however, that no proprietary preparations are admissible. The resolution passed in general session by the Association, that the Pharmacopœia, soon to be issued, should be at once practically adopted by physicians in prescribing, and by pharmacists in compounding, and that both it and the National Formulary be made text-books in Medical and Pharmaceutical Schools, originated in this Section.

The Milwaukee physicians and druggists, with the cordial support of the citizens, did much to make our short visit to their beautiful city a most enjoyable one.

Respectfully submitted, JAMES M. GOOD,
Chairman.

On motion, the report was received and referred to the Committee on Publication.

The following report of the finances of the various accounts in the care of the Secretary, was presented:

SUMMARY OF COSTS AND RECEIPTS FROM SALES OF NATIONAL FORMULARY, FROM JULY 1, 1892, TO JUNE 30, 1893.

I. EXPENSES.

Printing and binding 1000 copies	$210 00
Extra for binding 20 copies, interleaved	1 40
Circulars, expressage, postage, etc	52 98
Total expenses	$264 38

II. RECEIPTS.

From 6 dealers, not agents	$172 10
From office sales, according to order book	375 97
Total receipts	$548 07

III. REMITTANCES.

To Treasurer, as per Treasurer's receipts	$548 07

IV. BILLS RECEIVABLE.

From 7 dealers, not agents	$30 74

V. BILLS PAYABLE.

All bills rendered to date have been paid.

VI. COPIES DELIVERED GRATUITOUSLY.

To members of Revision Committee, 1 copy, cloth, interleaved, value at wholesale price	73
Previously reported, (Proceedings 1892, page 33), 1421 copies, value at wholesale price	$741 04
Total number, 1422 copies, value at wholesale price	$741 77

VII. STOCK ON HAND.

Copies in cloth	280
Copies in sheep	14
Total copies on hand	294

VIII. RECAPITULATION OF TOTAL RECEIPTS AND EXPENSES.

Remittances to Treasurer to May 30, 1892 (see Proceedings 1892, page 33).		$7,192 83
Remittances from June 1 to June 30, 1892 (see Proceedings 1892, page 34).		37 04
Remittances from July 1, 1892, to June 30, 1893 (see above)		548 07
Total cash receipts from National Formulary		$7,777 94
Cash payments to May 30, 1892 (see Proceedings 1892, page 33)	$4,532 12	
Cash payments from June 1, 1892, to June 30, 1893 (see above)	264 38	
Total cash payments for National Formulary		4,796 50
Total cash profit to June 30, 1893		$2,981 44

SALE OF PROCEEDINGS.

From July 1, 1892, to June 30, 1893, 9 sets, varying from 1 to 40 volumes, as per ledger account page 143 ..... $187 73
This amount has been remitted to the Treasurer.

ACCOUNT OF BADGES.

Balances accountable for July 1, 1892	158		
Received from S. A. D. Sheppard	10		
		168	
Badges, without bar, sold from July 1, 1892, to June 30, 1893, @ $2.00	142		$284 00
Badges, with bar, sold from July 1, 1892, to June 30, 1893, @ $2.50.	9		22 50
		151	
Total amount remitted to Treasurer for badges			$306 50
Balances accountable for June 30, 1893	17		

RECAPITULATION OF RECEIPTS AND EXPENSES OF BADGES.

Receipts from badges to May 30, 1892 (see Proceedings 1892, page 33)	$61 10	
Receipts from June 1, 1892, to June 30, 1892 (see Proceedings 1892, page 34	2 00	
Receipts from July 1, 1892, to June 30, 1893 (see above)	306 50	
Total receipts from badges.		$369 60
Cost of 200 badges	$350 00	
Bars presented by New England Committee.		
Cost of cut and electrotype	1 50	
Total expense of badges		351 50
Total profit from badges		$18 10

Philadelphia, June 30, 1893.

Mr. Kraemer read the following report:

The Committee appointed by the Council to re-arrange the programme of the meeting, hereby respectfully present the following report:

As the Section on Legislation and Education requires more time, and as the Chairman of the Section on Commercial Interests cannot be present on Tuesday, therefore the Committee make the following recommendations to the Association: That the Section on Legislation and Education hold its first meeting on Thursday, August 17, at 9 a. m., in Hall 22, in place of the third session of the Section on Scientific Papers, the Chairman of the latter Section stating that his Section will not need so much time, while the former Section requires more—thus the Section on Legislation and Education will have the entire day, Thursday. Also that the Section on Commercial Interests hold a third session on Friday evening, August 18, at 8 p. m., in Hall 22, according to the request of the Chairman of this Section.

On motion the Association adjourned.

Second Session, Tuesday Morning, August 15th.

The session was called to order in Hall XXIV. of the Art Palace at 10 a. m. by President Remington, and the proceedings were opened by the reading of the minutes of the first session, which were approved.

Mr. Kennedy, Secretary of the Council, read the minutes of that body, which were approved. The business transacted was as follows:

Third Session of the Council.—Art Institute, August 15, 1893. Present, 7 members.

Twenty applications for membership were examined and ordered to take the usual course.

Mr. Good, Chairman of the Council, presented his report on the condition of the various funds in his hands (see page —). On motion the report was accepted and referred to the Association.

Mr. Kennedy presented 113 new applications for membership which had been recommended by the Council for favorable consideration. On motion, the applicants were invited to become members.

On motion of Mr. Ebert, the Association endorsed two applications which were not accompanied by the required endorsements, since the applicants were not acquainted with any members of the Association.

Mr. Good, on behalf of the Nominating Committee, presented the following report:

The Nominating Committee respectfully submit the following names:
President—Edgar L. Patch, Boston.
First Vice-President—Leo Eliel, South Bend, Ind.
Second Vice-President—W. Rogers, Millersville, Ky.
Third Vice-President—Charles Caspari, Jr., Baltimore, Md.
Treasurer—S. A. D. Sheppard, Boston.
Permanent Secretary—J. M. Maisch, Philadelphia.
Reporter on the Progress of Pharmacy—Henry Kraemer, New York.
Members of the Council—C. L. Diehl, Louisville, Ky.; C. M. Ford, Denver, Col., and Wm. C. Alpers, Bayonne, N. J.

On motion, the report was accepted, and a ballot was ordered to be taken for the nominee for the office of President for the ensuing year, Messrs. Overstreet and Hamilton being appointed tellers by the Chair. The ballot resulted in the unanimous election of Edgar L. Patch as President.

On motion, the Secretary was instructed to cast an affirmative ballot for the election of the remaining nominees, which having been done, they were declared duly elected to their respective offices.

Mr. Sheppard, Chairman of the Committee on Time and Place of Next Meeting, presented the following report:

The Committee on Time and Place of Next Meeting has, as usual, a very interesting subject to consider, for, as is well known by members of the Association, it has become an established custom with us to hold our meetings alternately in a large city and at a

watering place. For instance, this year we are in a large city, last year we were in the White Mountains, the year before we were at New Orleans, the year before that we were at Old Point Comfort. Therefore, in the natural sequence, according to this custom, our meeting, next year, would not be in a large city. This, of course, is not a by-law, but it has become so well established and so well approved a custom that the committee were, by the custom, strongly inclined toward a watering place. There were presented, for the consideration of your committee, more strongly than any others, two watering places, namely, Hot Springs, Ark., and Asheville, N. C.

Denver, Col., presents, also, its claims as a large city, its representative also stating that if we insist on a watering place we could go to Manitou, south of Denver, or to Colorado Springs. An earnest invitation from both North Carolina and Arkansas made it difficult, in many ways, for your committee to decide which exerted the stronger pressure, so far as having an influence on our membership and the good of the Association is concerned, the argument being very nearly balanced in regard to the question of Asheville, N. C., and Hot Springs, Ark.; but finally the committee decided, though not unanimously, to recommend that the Association meet, next year, the first Monday in Juné, at Hot Springs, Ark.

It was moved and seconded that the report be adopted.

Mr. Watson moved that Asheville, N. C., be substituted for Hot Springs, Ark., and that the first Monday in September be substituted for the first Monday in June.

Mr. Watson: We all know, or most of us do, where Asheville is situated. It is half way between North and South, a nice ride from Boston or New York, an equal distance from Galveston, a less distance from New Orleans, and a little over a day's ride from St. Louis. Having competing lines entering Asheville, there are through vestibule trains running direct without change of cars, which affords ample and convenient accommodation for all who wish to attend the meetings to be held there. In behalf of the druggists of North Carolina and the citizens and pharmacists of Asheville, I desire to say that they very enthusiastically and unanimously desiré our next meeting to be held there. We all know that during the past forty years we have met elsewhere than in the State of North Carolina, although, I believe, North Carolina has regularly sent delegates to our meetings. We also know the many attractions afforded by Asheville and the surrounding country; we know that the hotel facilities there are as great as any in the South, Florida alone excepted. The Battery Park can accommodate from four to five hundred people; the rates are from $3.50 to $5 a day, but they propose to give this distinguished body a rate of $2.50 a day. We have looked into the matter of railroad rates, have seen the General Passenger Agent of the Richmond & Danville R. R., and those of other lines, and have been assured that reduced rates would be given; there is a reduced rate of one and a third of the regular fare, both winter and summer, on all roads entering Asheville, which is both a summer and a winter resort. The situation of Asheville and the manifold attractions offered by it are strong arguments in favor of our meeting there, and stronger than anything presented in behalf of any other place that has been suggested. When we met in the White Mountains, socially and in a business way, our meeting there was one of the best the Association has ever had. Now, Asheville, in point of situation, is somewhat like the White Mountains. The town is only a small place, built up solely through the place being a resort; although its population has increased during the last few years, there are no city attractions, but the only attractions are such as all will be able to participate in as a body. While the committee decided as well as they could, considering the limited information before them, I believe the result would have been different if we had been enabled to properly present the claims of Asheville.

For this reason we have offered the substitute, believing that if we meet at Asheville, the committee as well as all who attend there will thank us for having brought the matter forward in this way. We certainly feel that should you decide to meet at Asheville, our next meeting will be one of the best ever held, and the social pleasures will be such that we shall afterwards look back upon the meeting of 1894 as one of the brightest spots in our history as an Association.

Mr. Ebert moved that discussions of the claims of places recommended for the next place of meeting be limited to five minutes. The motion was seconded and carried.

Mr. Morrison: I wish to move, as an amendment, that the City of Montreal be substituted for Hot Springs. In moving that we visit a large city, I am perhaps acting contrary to the wishes of the Association, and the first I knew of your custom was from Mr. Sheppard's remarks, but I believe it would be very desirable for us to visit Montreal. It is now sixteen years since you were in Canada, when the Toronto meeting was held, in 1877. Since then, you have not been across the line. I think that the city of Montreal can bring out a number of attractions to draw a convention there. The city has become a great convention city. Last year, we had the National Wholesale Druggists' Association, and this year we had the convention of the Christian Endeavor Society. I think that both those associations were satisfied with the reception they met with and the treatment they received at Montreal. Owing to the limited number of Canadian members in this city, our representation here is not very strong, but I think that if you paid us a visit you would find a great many more Canadians would join the Association. Besides this, the climate is always of an even temperature there; you would not find it too warm, and the city has many natural advantages in respect to location. I need hardly refer to the mountains and other attractions offered for your enjoyment apart from the business purposes of the meeting, because they are probably familiar to most of you; but taking all the facts I have presented into consideration, I believe you would find it in every way to your advantage to meet, next year, at Montreal.

Mr. Simpson: In supporting the motion made by the gentleman from North Carolina, I extend to this Association, on behalf of the North Carolina Pharmaceutical Association and the Mayor and City Council of Asheville, N. C., a very cordial invitation to meet there, next year. It has been sixteen years since we met in Canada, but we have not met in North Carolina since the war, and I think it is just about time that we went there. If the Association decides to do so, we will show you what we have done with North Carolina and South Carolina.

Mr. Eisle: Hot Springs has everything that the gentlemen who presented the claims of Asheville have offered, and more too. We have a great many more features of interest than are possessed by Asheville. We present an invitation from the city government of Hot Springs, an invitation from the Board of Trade and Business Men's Club, an invitation—best of all—from the Arkansas Association of Pharmacists, and an invitation from the State Board of Pharmacy. We have never met in the South-west, and I feel confident that if the Association were to meet there, it would result in a great deal of good. We have excellent facilities for entertaining you, having three millions of dollars invested in hotels; we have a beautiful city, a beautiful Government Reservation, and at the time fixed by the committee for the meeting the surroundings of Hot Springs will appear at their best. The many natural features at the Springs will be a source of great pleasure to members attending the meeting. I assure you that you would receive a royal welcome, and I fully believe that if the Association visits Hot Springs, our meeting there will be one of the most enjoyable ever held. We have a reputation for hospitality.

We have entertained a great many Associations, and should be only too glad to have the American Pharmaceutical Association meet with us. The railroad authorities offer one fare for the round trip, and every possible reduction in hotel rates can be obtained. I sincerely hope that the Association will decide in favor of Hot Springs.

MR. ELIEL: I desire to make a few remarks on behalf of the committee and the members of this Association, irrespective of the different places proposed. The chief thing that we have to consider, go where we will, is the matter of comfort to ourselves and our friends, and the expense. We are likely to have rather close times ahead of us. The trip here, for many of the members, has been a very expensive one. We should make our selection with a view to comfort and pleasure and lessening the expense connected with it. I wish to say nothing against one place or the other, for, so far as I am personally concerned, if this Association should vote that we meet at Honolulu, I should probably go there.

MR. SIMON: In view of the fact that the representatives of two States have spoken, it may be well to listen to a few words from somebody who is not a citizen of either of those States. It has been claimed that the two places, in many respects, offer equal advantages. As far as Hot Springs is concerned, I think not only the springs are *hot*, as the name indicates, but the climate itself is decidedly warmer, and does not possess the beneficial qualities of the mountain air of Asheville. On the other hand, both places are said to have mountains, but the mountains surrounding Hot Springs are pretty good sized hills, while around Asheville there are mountains superior in height to the White Mountains. There are half a dozen mountains in the North Carolina range higher than Mount Washington. I know little about Hot Springs, yet from my personal experience I can say that Asheville is a most beautiful spot, and should the Association desire to go there it will have a most successful meeting.

MR. CASPARI: I would like to follow in the wake of the preceding speaker, and desire to say something about the druggists of North Carolina, although not representing either of the places that have been mentioned. I was present last year at their State meeting, and I was surprised at the great enthusiasm displayed by the North Carolina druggists in wishing to have our Association meet at Asheville. The rule, I believe, has been to not only alternate summer resorts with large cities, but to alternate eastern with western parts of the country; and having met in a large western city, I think it would be well for us to go east next year and meet in the city of Asheville. This place has many advantages, is as well situated as Hot Springs, and our meeting there would certainly result in increased membership. The advantages of both places have been so well brought before the Association by the previous speakers that I need not dwell upon them, but I believe the druggists of North Carolina would join the Association if we met at Asheville, and for this reason alone I consider Asheville is entitled to favorable consideration.

MR. WHELPLEY: All roads from Baltimore lead to North Carolina, but the roads from St. Louis lead to Hot Springs. I have had the good fortune to visit Hot Springs, and you know that "the proof of the pudding is in the eating of it." There are many here who have never tasted Hot Springs water; had they done so, they would vote unanimously for the best place in the United States at which the American Pharmaceutical Association can hold its meeting in 1894. Now I can honestly say that I was not in favor of our meeting in Hot Springs until I went there, but after seeing the place I became so thoroughly imbued with the enthusiasm of the Arkansas pharmacists in their earnest zeal and efforts to have the National Association meet there, that even my best friends in this Association cannot turn me from my feeling in that direction. I can only say this, that all the arguments made in favor of Asheville, its hotel rates, railroad rates,

scenery, the general comfort of the place, attendant expense, and convenience of meeting, will apply to Hot Springs; that the Missouri Pacific system will make one rate on any one of its lines; that all who go to Hot Springs in 1894 with the Association will come away feeling that the selection was well made.

MR. KRAEMER: I am a New Yorker, and have visited Asheville, N. C., about three times during the past year; and while I do like new pastures, and would like to go to Hot Springs, I feel that I must say a word in favor of North Carolina. I do not at all question the advantages in rates, accommodations, climate, etc., that have been presented in support of the two places, but I want to say one word about the druggists of North Carolina and the Pharmaceutical Association of North Carolina. The Association is one of the leading pharmaceutical organizations in this country. I have taken pains, during the past year, to look into the work and examine the record of every one of the State Associations, and I feel convinced that the North Carolina Association is one of which it can be said, "To whom that hath shall be given," and that the American Pharmaceutical Association, in recognition of this fact, ought to hold its meeting in North Carolina. For this reason I hope that all who can consistently do so will vote in favor of meeting at Asheville in preference to Hot Springs.

A vote was taken upon the amendment that the Association meet in the city of Montreal, and the amendment declared lost.

The motion to substitute Asheville, N. C., for Hot Springs was then carried by a large majority.

On motion of Mr. Whelpley, the vote for Asheville, N. C., was made unanimous.

On motion of Mr. Eliel, the first Monday in September was substituted for the first Monday in June as the time of meeting.

MR. WHITNEY: I wish to call attention to the action of the ladies at New Orleans, who came in at the last moment, not being satisfied with the Committee's report nor with the action of the Association, and by their personal appeal induced us to select White Mountains. I wish to say that if the ladies take any action this time, I hope it will be in that line, because I should be delighted to meet them at the Profile House again in 1894.

MR. WATSON: To dispense with the trouble and formality of having another meeting of the Nominating Committee, I wish to state that the druggists of Asheville recognize the suitability of but one man, Whitefoord G. Smith, for the position of Local Secretary at that place. Therefore I nominate Mr. Smith, of Asheville, for Local Secretary, and move that he be elected by acclamation.

This mode of procedure being objected to, the Nominating Committee came together for action, and subsequently reported favorably upon Mr. Smith's nomination. Upon motion, the Secretary cast an affirmative ballot for Mr. Smith's election, and he was declared duly elected to office.

Mr. Diehl read the following report of the Committee on National Formulary, which upon motion was received, and referred to the Committee on Publication:

To the American Pharmaceutical Association:

At the meeting of your Committee on National Formulary held at the Profile House, N. H., July 16, 1892, the work of the Committee was delegated to three sub-Committees, which have been constituted as follows:

1. *Sub-Committee on Correction of Formulas*—A. B. Stevens, Ann Arbor, Mich., Chairman; Charles A. Rapelye, Hartford, Conn.; Val. Schmidt, San Francisco, Cal.; Lucius E. Sayre, Lawrence, Kan.; Wm. W. Bartlet, Boston, Mass.

2. *Sub-Committee on Additions to Formulary*—Charles Caspari, Jr., Baltimore, Md., Chairman; G. H. C. Klie, St. Louis, Mo.; C. T. P. Fennel, Cincinnati, Ohio; C. S. N. Hallberg, Chicago, Ill.; F. R. Smith, Wilmington, Del.; Geo. D. Case, Milledgeville, Ga.; Henry R. Gray, Montreal, Canada; Sam'l L. Hilton, Washington, D. C.; R. N. Girling, New Orleans, La.

3. *Sub-Committee on Eliminations from Formulary*—C. T. P. Fennel, Cincinnati, Ohio, Chairman: Chas. M. Ford, Denver, Col.; Geo. W. Sloan, Indianapolis, Ind.; Chas. T. George, Harrisburg, Pa.; James O. Burge, Nashville, Tenn.

The discussion during this meeting of your Committee made it very evident that the formulas are generally satisfactory, that very few of them will require radical change, and that most of the changes necessary are pointed out in the "Epitome" presented at the last meeting of the Association. A circular letter was issued by the chairman to the members of the Committee, embracing his suggestions in accordance with this view, of which the following quotations may find place here:

"In the criticisms made by different writers, great stress is laid upon completeness of formulas: that is to say, that each formula shall be as complete in itself as is practicable, so that no reference to other formulas becomes necessary to supply the component parts entering into the preparation. The Chairman thinks that this should be done wherever practicable, even at the risk of frequent repetition of the same formula for a component entering different preparations. On the other hand, the convenience of stock preparations, to serve as vehicles or solvents for active medicinal agents, should not be lost sight of. This convenience is particularly noticeable in the preparations of elixirs, which, with a properly adjusted simple elixir, kept in stock, can be made extemporaneously. The difficulty with the present formulas for elixirs is, that there are a number of simple elixirs or stock preparations necessary in order to make them, and that reference must often be had to two, three, or more formulas in order to make the one preparation desired. It is believed that a great point will be gained in favor of the more uniform adoption of the Formulary by pharmacists, if it is possible to devise a formula for a simple elixir that is suitable for all compound elixirs. By suitable additions the equivalents of adjuvant elixir, of compound elixir of licorice, of compound elixir of taraxacum, etc., etc., might readily be made from this simple elixir, and such additions made a part of the formula for the compound preparations desired."

"It is desired that all the members of the Committee will take pains to ascertain what preparations in use in their localities are recommended as of sufficient importance to be added to the Formulary. The Chairman of the Sub-Committee on Additions will receive all communications in this connection, and will, doubtless, address the individual members of the General Committee on this subject at an early date. So far, comparatively few additions have been proposed, and the number of necessary or desirable additions will probably not be so great as some pharmacists are disposed to think."

"The work of the Sub-Committee on Eliminations is comparatively simple. By resolution of the General Committee, the Sub-Committee is instructed to retain all formulas not found so defective as to be absolutely worthless (subject, of course, to modifications proposed by the Sub-Committee on Corrections), and to drop all formulas for preparations that shall have been embodied in the forthcoming Pharmacopœia."

In conformity with his request, the Chairmen of the Sub-Committees reported the results of their work to the Chairman of the General Committee early in July, but a formal report was received only from the Sub-Committee on Corrections of Formulas, and this is appended in full to this report. Fragmentary reports only were received from the Sub-Committee on Additions and the Sub-Committee on Eliminations, the essentials of which are as follows:

REPORT OF SUB-COMMITTEE ON ADDITIONS TO FORMULARY.

The Chairman, Mr. Charles Caspari, Jr., says that but very few suggestions for additions have been made, and that the replies received to his inquiries are more in the nature of comments and criticisms of old formulas. The uncertainty of the contents of the forthcoming Pharmacopœia may possibly influence some, and a desire to condense rather than to increase the volume of the present Formulary seems to prevail. In Maryland, and particularly in Baltimore, the Formulary has not taken firm root, notwithstanding persistent endeavors to advocate its adoption, and the favorable comment of the Maryland State Medical Society.

The following is a condensation of the suggestions received by Mr. Caspari:

From Mr. Henry R. Gray, Montreal.

LIQUOR MAGNESIAE EFFERVESCENS.

Acid citr. crystals	℥ i
Magnesia Sulph	℥ vi
Syrup. citric acid	℥ ij
Potass. bicarb. crystals	gr. xlv
Water suff. to make	℥ xj.

Make a solution.

This is more easily prepared than solution of citrate of magnesia, quite efficient, and will keep any length of time.

SYRUP. CODEINE SULPH.—The official preparation of the "Codex" is too weak. Mr. Gray suggests that a formula for a syrup be constructed containing ½ grain of sulphate of codeine to the fluid drachm.

From Chas. Fisher & Co., Peoria, Ill.

SYR. HYPOPHOS. CO. N. F.—These gentlemen say that they have not been able to get a satisfactory product by the present formula, and would like if possible to see an improvement. A ropy, yellowish deposit will form, in spite of proper manipulation.

From Mr. S. L. Hilton, Washington, D. C.

Mr. Hilton, in a former communication to the Chairman of the General Committee, made some suggestions in regard to additions, and now gives complete formulas as follows:

ELIXIR PARALDEHYDE.

Paraldehyde	f. ℥ j
Alcohol	f. ℥ vij
Extract vanilla	f. ℥ iv
Water	f. ℥ iv
Syrup aurantii, U. S. P., 1880	f. ℥ vj.

Filter if necessary.

ELIXIR DIGESTIVUS COMP.

Pepsin (soluble scales)	gr. 300
Pancreatin	gr. 30
Ptyalin or diastase of malt	gr. 30
Lactic acid	♏ 85
Glycerin	f. ℥ xvj
Water	f. ℥ viij
Tincture persionis (N. F.)	f. ℥ ijss
Talcum purified	℥ j
Elixir aromatic	q. s. Oiv.

Add the acids to the water and glycerin, and to this mixture add the pepsin, pan-

creatin and diastase, and macerate until apparently dissolved. Then add the tincture persionis and enough elixir aromatic to make 4 pints. Thoroughly incorporate the purified talcum and filter through paper.

GLYCERIT. GUAIACI.

Guaiaci powder	gr. 640
Liquor potass., U. S. P.	f. ℥ j
Glycerin	f. ℥ ix
Aqua	q. s. ad. f. ℥ xvj.

Add the liquor potass. to aqua f. ℥ vj, and to the mixture add the powdered guiaci; macerate for 24 hours with occasional agitation, filter, add the glycerin and enough water to make —.

SYRUP. PINUS ALBA COMP.

Fluid extract white pine bark,		
Fluid extract wild cherry bark	āā	f. ℥ j
Fluid extract spikenard,		
Fluid extract balm Gilead buds	āā	♏ 64
Fluid extract blood root		♏ 48
Fluid extract sassafras		♏ 32
Morphia sulphas		gr. 3
Chloroform (purified)		♏ 64.
Glycerin		f. ℥ j
Sugar		℥ xiij av.
Water, distil., q. s. ad.		Oj.

Mix the fluid extracts and glycerin and triturate with pruified talcum ℥ ij, then add water f ℥ viss, filter, and to the filtrate add the sugar, dissolve by agitation: add the chloroform and sulph. morphia.

Or this preparation may be made directly from the drugs, as follows:

White pine bark,		
Wild cherry bark	āā	℥ iv
Spikenard,		
Balm Gilead buds	āā	℥ iv
Sassafras bark		℥ iij
Blood root		℥ iijss.

Reduce the drugs to a moderately coarse No. 40 powder and percolate with a menstruum of alcohol and water (alcohol, 1 pint; water, 3 pints;) until 32 fluid ounces have been obtained; in this dissolve 56 ounces sugar, and add

Morphia sulphas	gr. xij
Chloroform	℥ iij
Add syrup to make	Oiv.

Lastly, Mr. Hilton offers a preparation to take the place of a popular nostrum sold under the name of "Viburnum Comp.," and proposes for it the name of

TR. VIBURNUM OPUL. COMP.

Cramp bark		℥ iv
Wild yam		℥ iv
Skullcap		℥ j
Cloves		℥ vj
Cinnamon (cassia)		℥ viij
Glycerin		f. ℥ viij
Alcohol,		
Water	āā	q. s. Cong. j.

Mix the water and the alcohol in proportion of 5 pints of alcohol to 1 pint water (by

weight). Having reduced the drugs to a moderately coarse No. 40 powder, moisten with sufficient menstruum, with the glycerin added, and macerate 48 hours. Pack the powder firmly in a cylindrical percolator, and gradually pour on the menstruum until one gallon finished product is obtained.

From Mr. G. H. Chas. Klie. Mr. Klie has not himself found time to do anything, but has succeeded in getting a number of responses to his inquiries, among which are the following:

COMMENTS ON THE NATIONAL FORMULARY.

Pleasant vehicles is the subject that has occupied most of my attention in my work on the National Formulary.

Granting that the physician could, and would, most often set out his own formulary in his prescription, my aim is to assist him in disguising disagreeable medicines and in improving their appearance. That an elixir is nearer the object sought than any other compounds we have among pharmaceutical preparations, we all admit. That our National Formulary contains a compilation of some of the nicest and most pleasant in modern pharmacy, is true; coming from that grand authority, the American Pharmaceutical Association, is conclusive evidence.

The greatest objection to our present Formulary is that it contains too much. It leads to confusion and loss of interest in its contents by the masses.

The success of the N. Y. & B. Formulary was, to a great extent, due to the condensed and restricted information it contained. That was what pleased me at once when I first saw the work. When that was issued we had other Formularies in print just as good and instructive, but all contained too much, or more than the average pharmacist could study and examine during the few leisure moments he has. The N. Y. & B. edition had a nice, good thing in a nutshell, and was accordingly appreciated.

A condensation of the National Formulary, and consequent elimination of a great many formulas, is my idea of the next revision. Such things as boroglycerin, sedative water, traumatic balsam, and others, might very readily be dropped. Our other text books and pharmaceutical literature will give us all the information we want on the less popular prescriptions.

Make an official guide as condensed as possible, and you will come nearer pleasing the masses. Fewer and simpler medicines is the drift of modern practitioners. Don't have two or more formulas of elixir iron, quinine, and strychnine, or emulsion of cod liver oil. Let the Committee on Revision experiment until a satisfactory formula is obtained, then publish that and none other. A duplication of formula is simply an imitation of our present condition. Where we have now half a dozen emulsions of cod liver oil of different formulas on our shelves, we will *then* be compelled to dispense the same thing in half a dozen different ways. Or the majority of druggists will have as many different National Formulary emulsions as the different physicians will prescribe. Dr. A. will prescribe an acacia emulsion and Dr. B. an Irish moss emulsion.

The manufacturing pharmacist will get his work in and soon fill our shelves again. What will we have gained in the end? Nothing. True pharmacy will only suffer thereby.

On the elixirs I have the following criticisms to make:

No. 48, elixir calisaya, iron, lactophosphate of lime, is very unstable. Not used here.

No. 63, elixir phosphate iron, quinine, and strychnine, very unsatisfactory. I very much prefer No. 65. Although not identical, they are used for the other.

No. 80, malt and iron, is a failure with me. So is No. 93, comp. elixir quinine and phosphate.

No. 253, mist. chloral and potass. brom., is very unsatisfactory.

The following I have been able to introduce and have my physicians prescribe, with satisfactory results: syrup and elixir Yerba Santa, elixir tarax. comp. elixir adjuvant, syrup licorice, extract and aromatic elixir gentian, elixir gentian and iron, elixir pepsin,

elixir rhubarb, elixir celery, compound elixir calisaya, elixir calisaya det., elixir pot. acet. and juniper, elixir anise., elixir hypophos. and iron, syrup hypophosphate, simple and compound, and a number of others less frequently. As a whole, I have had decided success in National Formulary preparations.

Mr. C. E. Corcoran, writing to Mr. Klie, thinks it will not be worth while to try to do anything until the new Pharmacopœia comes out, understanding that a good deal of what is in the National Formulary will be incorporated in it. He considers many of the formulas defective and in need of correction. He suggests that a department should be added giving all useful information that any druggist can in any way need.

Mr. Geo. Ude, writing to Mr. Klie, suggests an improved formula for

AROMATIC ELIXIR.

Fresh orange peel, expulpated	4 ozs.
Fresh lemon peel, expulpated	$\frac{1}{2}$ oz.
Coriander seed	$\frac{1}{2}$ oz.
Star anise seed	$\frac{1}{4}$ oz.
Deodorized alcohol	4 pints
Water	6 pints
Syrup	6 pints.

Macerate the drugs in a mixture of the alcohol and water for four days or longer, strain and filter, and add the syrup. The result is a nice, clear elixir at once.

Mr. Ude also suggests that the formula for *Elixir Rhamnus Purshiana* be constructed so as to deprive the preparation of bitter taste.

REPORT OF COMMITTEE ON ELIMINATIONS FROM FORMULARY.

Under date of June 27th, Mr. C. T. P. Fennel, the Chairman, writes that he had notified every member of his Sub-Committee of their duties, and what was expected of them, but failed to hear from any of them. Also that he had personally been unable to do anything, by reason of other work for the Association.

Under dates of July 4th and 6th, however, he writes that having again written, he has received replies from two members of his committee. Mr. Fennel has made a hurried survey, and now reports the following:

1. I should eliminate all preparations that are officinal in other Pharmacopœias.

2. I should eliminate:

No. 4. Owing to decomposition upon standing, to form partly, and eventually completely, tribasic acid.

No. 8. Owing to its similarity to tincture benzoin comp.

No. 9. Owing to its decomposition in the course of time and also while drying to form oxide, noticeable in change of color from pure white to lemon, and finally true yellow.

No. 10. Owing to its proneness to absorb moisture, and the consequent loss of definite strength.

The Glycerite No. 184 is serviceable under all conditions.

No. 14 and 15 may do for working formulæ, but my experience has been anything but satisfactory.

No. 17. The faults of this formula are given in the U. S. Disp., and should be known to every pharmacist.

No. 32. Should be eliminated to avoid confusion, and the 2d of No. 207 adopted.

Discard:

No. 75. Conflicting with the officinal syrup.

No. 113. Conflicting with the officinal preparation mistura chloroform.

Regarding emulsions, one general formula should be adopted. Experience has proven the acacia emulsion to be permanent and palatable, and the best in the long run.

No. 207. Discard the first formula and adopt uniformity in classes.

No. 315. Should be discarded for ethical reasons; looks to me like encouraging substitution and adulteration.

All syrups corresponding to elixirs should be eliminated.

Mr. Fennel also reports the following suggestions from Mr. Sloan:

No. 6. Discard.

No. 41. Instead of oil cassia use creasote; omit the water, using alcohol to make the full amount.

No. 192. Discard.

No. 232. Discard.

No. 236. Discard.

No. 249. Discard.

No. 254. Use Chandler's formula for this.

No. 268. Discard.

No. 377. Use Parrish's formula for this.

Mr. Fennel finally reports briefly the suggestions from Mr. Burge, who would like to eliminate quite a number of preparations, on the ground of "No demand;" but as this reason (under the instruction of the General Committee) is not a valid one, he does not feel warranted to drop any.

Report of Committee on Corrections of Formulas.

Ann Arbor, Mich., *July* 15, 1893.

Your Committee on Corrections would respectfully make the following report: When one formula is used in the manufacture of another the number of the formula should be given as well as the name. Thus

Elixir of Phosphate of Iron.

Phosphate of iron, U. S. P.	28 gr,
Water	½ fl. oz.
Elixir of gentian (67) enough to make	16 fl. oz.

The formula for aromatic elixir has proved very satisfactory, and should be retained with slight modification, but in view of the fact that the compound aromatic spirits and aromatic elixir will be official, we may omit the formula and refer to them as aromatic elixir U. S. P., etc. We recommend that adjuvant elixir be omitted and that aromatic elixir be used in its place.

Some are in favor of omitting the citric acid from all the elixirs of the bromides, but this might not be necessary if aromatic elixir is used in place of elixir adjuvant. As these elixirs have been made with a dark-colored elixir, it would be well to color with comp. tincture of cudbear.

We would recommend that carbonate of magnesia be used in place of purified talcum.

Schmitt recommends that elixir valerianate of ammonia be improved by substituting the following:

Valerianic acid	120 minims
Water	2 fl. oz.
Carbonate of ammonia	q. s.
Simple elixir	14 fl. oz.
Solution of carmine	30 minims.

Put the acid in a graduate and add the carbonate of ammonia to slightly supersaturate, add the elixir, color and filter.

No. 40. Comp. cathartic elixir. We would use aromatic elixir in place of elixir of liquorice.

No. 42. Elixir of cinchona. Modified as follows:

Tr. cinchona U. S. P.	2½ fl. oz.
Syrup	2 fl. oz.
Glycerin	2 fl. oz.
Aromatic elixir, enough to make	16 fl. oz.

No. 63. Elixir of the Phosphate of Iron, Quinine and Strychnin has, doubtless, caused more trouble than all the other elixirs. This is due to the fact that citrates form with the salts of quinine, a citrate of quinine which is very sparingly soluble, indeed less soluble in water or alcohol than the free alkaloid quinine. Therefore we should make the following changes:

Phosphate of Iron, U. S. P., 1880	256 grains.
Quinia (alkaloid)	128 "
Strychnin	1¼ "
Alcohol	2 fl. oz.
Water	360 minims.
Aromatic elixir, enough to make	16 fl. oz.

Dissolve the alkaloids in the alcohol with heat, and add to 12 fl. oz. of aromatic elixir, then dissolve the iron in the water with heat, and add to the mixture, finally add enough aromatic elixir to make 16 fl. oz.

No. 65. To be made the same, except that the 2 fl. oz of tincture of citro-chloride of iron is retained.

No. 93. Elixir of quinine et phosphatum compositum. Use quinia (alkaloid) in place of sulphate, and add three (3) fl. dr. of alcohol to dissolve the quinia. It would be advisable to make the same change in No. 428, Wine of Beef, Iron and Cinchona, but it is not necessary, as the amount of citrate of quinine formed would be so small that it would remain in solution.

No. 67. Elixir of Gentian. Replace by the following:

Fl. extract gentian	½ fl. oz.
Tincture cardamom comp., U. S. P.	180 mimims.
Aromatic elixir, enough to make	16 fl. oz.

No. 95. Elixir Rhamnus Purshiana. Omit elixir of glycyrrhiza and add compound elixir of taraxacum to make 16 fl. oz.

No. 96. Elixir Rhamnus Purshiana comp. Use compound elixir of taraxacum in place of the following: Fl. extract liquorice, compound tincture of cardamom, aromatic spirits, syrup and water.

No. 99. Comp. elixir of blackberry. Replace ⅓ of the syrup with glycerin.

No. 105. Elixir of taraxacum. Klie's formula, A. P. A. Proc., 1892, page 89, would be an improvement. It is as follows:

Fl. extract of taraxacum	2 fl. oz.
Fl. extract of orange peel (sweet)	1 fl. oz.
Fl. extract of liquorice root	1 fl. oz.
Tincture of cinnamon	2 fl. oz.
Compound tincture of cardamom	2 fl. oz.
Aromatic elixir, U. S. P.	55 fl. oz.

Let stand a few days and filter.

No. 122. Omit the yolk of egg and increase the acacia to 120 grains.

No. 193. Lac fermentatum. Retain it as it is, but add as a note the first three paragraphs on page 78 of A. P. A. Proc., 1892.

No. 241. Add sulphate of copper 5 tr. oz.

No. 254. Chloroform anodyne. The formula given on page 79 of A. P. A. Proc., 1892, is a decided improvement over that of the N. F., but we believe it would be better to use a definite substance like morphine in place of a preparation of an uncertain strength like the deodorized tincture of opium of the market. Therefore we would recommend the following:

Chloroform	2 fl. oz.
Ether	½ "
Tincture cannabis indica	2 "
Tincture capsicum	1 "
Sulphate of morphia	18 grains.
Oil of peppermint	16 minims.
Hydrocyanic acid diluted	1 fl. oz.
Glycerin	2 "
Water	1 "
Alcohol enough to make	16 "

The hydrocyanic acid might be omitted if thought best.

No. 256. No. 2. Chapman's mixture. Double the tincture of lavender compound. Use 1½ oz. of acacia in place of the mucilage, and add 1 oz. of syrup.

No. 363. Syrup of citro-iodide of iron. Use 295 grains of iodine in place of 267 grains to form the ferrous iodide, then add 133 grains to form the ferric iodide.

No. 370. Compound syrup of hypophosphites. We believe that this formula could be improved by substituting the formula given by Francis Hemm, Ph.G. It is as follows:

Compound Syrup of Hypophosphites.

Formula No. 2.

Calcium hypophosphite	280 grains.
Potassium hypophosphite	128 "
Sodium hypophosphite	128 "
Manganese sulphate, crystallized	24 "
Ferrous sulphate, precipitated	24 "
Quinine (dry)	8 "
Strychnine (dry)	½ grain.
Diluted hypophosphorous acid, N. F.	30 minims.
Glycerin	f. ℥ ij
Distilled orange-flower water	f. ℥ ij
Sugar, granular, Crown A.	℥ x
Distilled water	q. s. to make f. ℥ xvj.

Dissolve 24½ grains of hypophosphite of calcium in one fluidounce of distilled water, and filter or strain through cotton. Dissolve the iron and manganese sulphates in two fluidrachms of distilled water and add the diluted hypophosphorous acid; filter or strain through cotton. Mix the two solutions together in a small bottle just large enough to contain same, agitate it several times while leaving it to react for one hour. Dissolve the hypophosphite salts in four fluidounces of distilled water, to which add the glycerin and orange-flower water. Filter also the iron and manganese sulphates solution into it, add the quinine and strychnine, and shake frequently until dissolved, and if necessary, add drop by drop diluted hypophosphorous acid to effect solution. Put the sugar into a graduated bottle and filter this solution upon it, shake well, and if required, add sufficient more distilled water to make the whole measure sixteen fluidounces. Now shake often until all of the sugar dissolves, and then filter through white filter-paper.

No. 376. Pectoral syrup. Should be replaced by Dr. Jackson's original formula.

No. 390. No. 2. Anti-periodic tincture with aloes. Aqueous extract of aloes should be 128 grains instead of 28 grains.

Summing up the result of the labors of the several Sub-Committees, it must be admitted that apparently very little progress has been made during the year. Nevertheless, there has been an important gain in so far as it has become clearly evident: 1. That the defects in the formulas are few, have been already pointed out in previous reports, and are easily remedied. 2. That notwithstanding the prevalent opinion that large additions should be made to the Formulary, the number of desirable additions is really very small; and, 3. That when the eliminations shall have been effected, the number of formulas transferred to the new Pharmacopœia will, in all probability, be largely in excess of the new ones adopted, and a revised Formulary will therefore be contracted rather than augmented in its volume.

The Chairman suggests that this Committee be now instructed to present the complete manuscript for a revised edition of the National Formulary at the next annual meeting of this Association; and furthermore, in view of the desirability of placing the Formulary in the hands of every physician, that this Committee should be instructed to prepare the manuscript for an "Epitome" of the revised Formulary, and to present the same if possible with the manuscript for the Formulary.

Respectfully submitted, C. LEWIS DIEHL, *Chairman.*

Dr. Hoffman, in behalf of the Committee on Resolutions to Professor Maisch, reported as follows:

Your Committee on Resolutions to Professor Maisch beg leave to present the following, which, if adopted as the sentiment of the Association, we trust may be forwarded to our Permanent Secretary:

"Chicago, August 15, 1893.—Professor Jno. M. Maisch: The American Pharmaceutical Association assembled, conveys to you the heartiest greetings and the sympathy of its members in your sufferings. They keenly feel and regret your absence, and trust that you may find consolation in the knowledge that their love and esteem are with you, and that your eminent and enduring services for the promotion of the Association, and for the elevation and advancement of pharmacy, will ever remain an ornament in the annals of American pharmacy." Signed, FRED. HOFFMANN,
ALBERT E. EBERT,
G. A. ZWICK,
Committee.

By a rising vote the Association unanimously adopted the resolution.

Mr. Kennedy presented the report of the Committee on Membership (see page 16), which on motion was received and referred to the Committee on Publication.

Mr. Kraemer read the following introduction to the report on the progress of pharmacy:

NEW YORK, August 14, 1893.

Mr. President and Gentlemen:

The Report on the Progress of Pharmacy for the year 1892–3 is nearly completed. Besides the review of a few journals, it yet remains to be arranged for the hands of the printer. It is very proper that the American Pharmaceutical Association, at this meeting, gain some idea of the contents of this report and of the work of the reporter. The aim of the latter has been to follow along the original plan of Prof. Diehl and the still newer lines adopted by Dr. Charles Rice in the previous report. He has, moreover,

consulted the various publications in science of a similar nature, with the intention of adopting that course which should embrace the salient features of them all. He has likewise received suggestions from various sources, and is still open to them.

The pharmaceutical profession is composed of men of various minds and diverse inclinations. Few are without some subject which demands their spare moments, and each one is running his business upon lines which suit either his ambition or lack of ambition. We believe, from contact with the members of our profession and the reviews of the pharmaceutical journals, that these reports on the Progress of Pharmacy are the *convenient avenues* through which the progress of the labors in all lines of legitimate pharmacy must be obtained. Abstracts of important articles are sufficient for many, but there are those for whom even this is not sufficient, and these are they who desire to know where all that has been written during the current year may be found. Ofttimes this concentrated information must be secured in a limited time. Then too some of our most prominent business men, upon whom rests the entire financial responsibility and consequent advancement of our pharmaceutical colleges, require ofttimes, at least, to know where such information upon the more general topics may be found. So this year, in addition to the general abstracts, which we believe to be as complete as usual, we have made mention of and reference to all those papers (with or without explanation, as seemed necessary) which contained anything of interest and value to the progressive minds of our calling. In all these cases the name of the journal or author is often a criterion of the character of the article. With this brief explanation, we now give the important titles of the contents of this report.

I. *Pharmacy.*

1. Apparatus and Manipulations (with Illustrations).
2. Prescription Difficulties.
3. Pharmaceutical Preparations; from Assay to Vina. (Arrangement alphabetical.)
4. Proceedings of all State Pharmaceutical Associations, with mention and abstracts of important papers read.
5. General; including references to and information upon Statistics, the Patent Medicine Problem, Physicians Dispensing and Pharmacists Prescribing Medicines, the Dispensing Counter, Dispensaries, Sale of Poisons, Legislation, Metric System and Metrology, Relation of Clerks to Proprietors and vice versa, Advertising, Colleges and Education, Boards of Pharmacy, Pharmacy as Carried on Abroad and at Home, Women in Pharmacy.
6. General Formulæ.
7. Soda Water Formulæ and Fountain.
8. Medical Information of Interest and Importance to the Pharmacist.
9. Adulterations.
10. Rubber Goods.
11. Pharmacognostical Work.
12. Bacteriology and Disinfectants.
13. Urinary Analysis.
14. New Remedies.

II. *Chemistry.*

1. General, Physical and Theoretical Chemistry.
2. Analytical Chemistry.
3. Reagents.
4. Nomenclature.
5. Inorganic Acids.
6. Inorganic Chemistry: Elements with Properties from Aluminium to Zinc. (Arrangement alphabetical.)

7. Organic Chemistry: General and Theoretical.
8. Alkaloids.
9. Organic Acids.
10. Organic Compounds, including Fixed and Volatile Oils and references to important articles demonstrating chemical progress in this domain. (Arrangement alphabetical.)
11. Applied Chemistry: Butter, Milk, etc.

III. Materia Medica (Animal and Vegetable) and Botany.

1. General.
2. Medicinal Flora of the World.
3. Educational.
4. Nomenclature.
5. Insecticides, etc.
6. Plant Constituents (not otherwise included in other subjects).
7. Algæ.
8. Animal.
9. N. O. from Anacardiaceæ to Vitaceæ. (Alphabetical arrangement.)

IV. Bibliography. (As complete as possible.)

V. Obituary. Name, date of birth and death of the most prominent Pharmacists, Botanists and Chemists.

From this brief resumé, though he is not by any means satisfied with the extent of this work, you may see that the Reporter has endeavored to make this report truly indicative of pharmaceutical progress during 1892–93, and furthermore of such a nature that every one engaged or interested in pharmaceutical affairs, may be repaid by being the possessor of a copy of our Proceedings. How he has succeeded, remains for you to decide when the work is in your hands for its practical use.

Now, a brief suggestion for your consideration, in order to make this report even more valuable to the members of this Association and a source of greater benefit to the scientific world. With the immense amount of work done each year and the great difficulty of keeping up with this work and with that which has already been done, and hence the urgent and ofttimes irksome labor each student finds attendant in his researches in looking up references, it seems to the Reporter that the time must come when the information of not only this year, but of previous years, must be gathered together at some one central point of learning, and where those who so desire can spare themselves much time, labor and repetition by securing at little and certainly less expense this necessary information. It is not the object of the Reporter to discuss the problem, but simply to suggest a preparatory step which may have for its outcome in the years to come some such measure as this. This suggestion is not new, for the same thought was evidently in the mind of Prof. Diehl, in his last report two years ago. (See Proceedings 1891, 260.)

The suggestion is that: if we as an Association, could secure the services of at least three men (or make such arrangements that the Reporter secure the services of two) who have the oversight and interest in the compilation and dissemination of knowledge, to gather together each year everything published in the domain of Pharmacy, and that of Chemistry, Botany and Medicine, as related to Pharmacy and some of the collateral sciences, the report would be of much more value. And furthermore, if we could, apart from the Proceedings, publish at least every three months such information as relates to the titles of all such papers published, with or without a brief explanation as may seem necessary, and with some mark indicating original and valuable papers from the others, the Report on the Progress of Pharmacy would be fresh and of infinitely more value, for it would be *up to the times*. Then at the close of the year, the proceedings being issued as usual, with a brief report by abstracts of Pharmaceutical Progress, as seemed

necessary to the collaborators, the work would be complete for all intelligent minds and for all times.

Granting this suggestion a wise one, the question of finances to carry on this work must be considered. We do not believe in beginning such a work unless there is a specific fund provided, the interest of which is to be used in this direction, or else a similar measure might be provided, whereby it would be like the American Pharmaceutical Association itself, a sure thing for all time. And because of the confidence in the financial policy and soundness of this Association, the Reporter has thus ventured to suggest a measure, which may seem a little stupendous at first to some, yet with a little further thought and reflection they will see it only as the natural sequence and development of the progressive work of this Association, which some of you have been laboring so faithfully these many years to bring to pass.

The question of doing such a work and of securing the means for its successful prosecution, will come when we are ready to consider the work. That this work will be done by competent men in these different departments of science of some nation or association at some time we feel confident, for the tendency of the age is towards *specialization*, *thoroughness*, *completeness* and *concentration*. We have had this matter in mind for some time, and felt, until recently, that it would be better to wait another year before making this suggestion and presenting it in this crude state to you, but it seems eminently proper on this anniversary and at this time, when we see so much in this great city at present of specialization, thoroughness, completeness and concentration, and its benfits, to bring this suggestion before you for your thought and your solution.

HENRY KRAEMER,
Reporter on the Progress of Pharmacy, 1892–1893.

MR. SAYRE: I move that the report be received, and that a committee of three be appointed to consider the recommendations contained therein. These recommendations are very important, and I should like to add one more to them, which is, that when the reports of the proceedings are published, they be published as the Pharmacopœia is published, so that teachers and students who are writing upon certain subjects can take the pages apart and make their clippings just as they want to. It seems to me that this would be no expense whatever to the Association. There are a number of teachers, members of the Association, who would like to get the proceedings just in that way, and the pages should therefore be printed on one side only. There is another suggestion I have to make, which is, that there should be a committee appointed having a chairman to whom requests for information could be addressed. We have thousands of students, all over the United States, who are constantly wanting information upon some particular subject in which they are interested; and if, in consideration of a small amount, they could obtain this information, they could settle certain doubtful points at once, and would not waste a large part of their time in going over and finding out what other people have done, and in this way we could assist our students greatly, and help to advance pharmacy. I therefore move the adoption of the report, and that the proposed recommendations be approved.

MR. EBERT: The American Pharmaceutical Association, no doubt, desires to disseminate all the information it possibly can in a practical way, and I hope, therefore, that we shall not undertake any new plans for this purpose until we have well considered and tried them. Some competent people might advantageously advertise themselves as such a bureau of information, but as to this Association itself becoming such a bureau, that is entirely inappropriate, and I hope it will never be done. Again, I hope that the Reporter on the Progress of Pharmacy has been very careful not to put too much into his report which might be used by the "microbe killer" in making an advertisement, and saying that "he found it recommended in the publication of the American Pharmaceutical Association," or that "his great discovery was found there."

Now, gentlemen, we should go very slowly. The old men are sometimes very wise. I remember when I first joined this Association that I was going to have every other pharmacist in the United States follow my example and join also. I would now keep half of them out if I could possibly do it. I have heard a report to-day which stated that when a drag-net was sent all over the United States and they took in three or four hundred druggists, they found that although they all applied for membership, only fifty per cent. of them were willing to pay their contributions to the Association. The drag-net theory was commendable, but the practice proved to be otherwise. Now, gentlemen, this is not the proper course to follow. I want to say, now, to the Reporter on the Progress of Pharmacy and to this committee, if you appoint such a one, leave well enough alone, don't go too fast, don't try to make money or become impressed with the idea that you will make money by publishing a lot of formulæ, or gain a great deal by enlarging our Proceedings in certain directions. We do not want that. There are, I believe, between twenty and forty journals published in this country, giving us all this practical information and all these matters of trade interest, and we don't want that in the Proceedings. What we do want is, to conduct this Association in a dignified manner, and to have this Association represent American pharmacy as it has represented it in the time past.

In regard to separating the work of the Reporter on Progress of Pharmacy, I would say that we had better have one man responsible for the work. He can give us enough, if he is the right man for the position. If, on the contrary, you appoint two or three more men to do the work, and each man has a specialty, your Proceedings will be teeming with didactics, and we shall be all confused when we have to refer to the volume, because we are not all interested in didactics or the microscope. I only caution you to be careful. By going slow we shall do a great deal more good than by rushing into these new-fangled ideas which are often presented, and sometimes, no doubt, are very good, but which should be tried carefully.

With respect to Professor Sayre's remarks, I would say that we all know the teachers of pharmacy would like to have this Association give them all the help possible, so that they can disseminate the truth, etc., but I hope that these teachers of pharmacy will give the boys a little more practical information. Do not give them so much theoretical information. I have had some boys come into my store who were so well imbued with the professional work that they did not know how to carry out the practical part of the business.

MR. BRESLIN: No harm can arise from establishing what the gentleman terms "a bureau of information." It has frequently occurred to many of the practicing pharmacists—the every-day, humble pharmacists, as they may be styled—to seek for information when they meet with obstacles which it is impossible for them to overcome, and whose solution does not appear very clear to them. Now what is the source of information open to a pharmacist under these circumstances? He writes to some one of the pharmaceutical journals on the subject, but the question arises, is that journal supplied with the talent required to meet the demand? Admitting that it is, how long will it take that journal to forward the information? Will its conductors put themselves to the trouble of furnishing it at once? That will be optional with them. On the other hand, the establishment of a bureau of information by the American Pharmaceutical Association would work untold good, in furnishing a source of information to its members, and I cannot see how any patent medicine man could possibly work around this body. This information is to be restricted solely to the members, and I dare say there is not a member of the American Pharmaceutical Association who does not possess sufficient principle to uphold the honor and dignity of the Association. Now, sir, let us establish the latest and the most improved methods. Because we have been traveling in the old rut is no

argument that we should continue in it. I can conceive of no serious consequences that could befall this Association through the establishment of a bureau of information. On the contrary, such a course would reflect infinite credit upon this body: it would show progress, it would disseminate knowledge, it would be of general assistance, and it would be of untold good to the members of our profession. During the past twenty-seven years, in my experience as a humble pharmacist, I have met with many an obstacle. My early education in pharmacy has been very limited, and an opportunity to refer to a bureau of information such as we have had proposed, would be an advantage to me at all times; I should know in what direction to look for the information, and knowing that I could apply to a committee of this Association for this purpose, who would put themselves to the trouble of writing to me and telling me what I want to know, would be of great value to one who is placed in a difficult position and handicapped. I am strongly in favor of the establishment of a bureau of information.

MR. SAYRE: Instead of facilitating the proceedings to-day, I fear I have interrupted the progress of business by making the first remark. I want to apologize for that, and move that this report be adopted, and that a committee of three be appointed to consider the propositions contained therein. I appreciate that we must have radical progress on the one side and a conservative policy on the other, and have been pleased to hear the conservative opinion expressed. I am also very glad that we have with us our friend, Mr. Ebert, to hold us down.

MR. JAMIESON: The plan recommended by the Reporter on the Progress of Pharmacy provides for the appointment of two more salaried officers by the Association, which would largely increase the expense of publishing the report, and on this account the matter should be referred to the Council.

Mr. Sayre having accepted this amendment, the motion was put to a vote and carried.

The President introduced Mr. William Martindale, delegate to the American Pharmaceutical Association from Great Britain, and read the following credential:

"*To the President of the American Pharmaceutical Association:*

This is to certify that the bearer, William Martindale, Esq., Fellow of the Chemical Society, has been appointed a delegate from that Society to the forty-first annual meeting of the American Pharmaceutical Association, at Chicago, on August 14th, 1893.

(Signed) RICHARD BREMRIDGE,
Registrar of the Pharmaceutical Society of Great Britain."

Mr. Martindale addressed the Association as follows:

Gentlemen: I thank you for the honor you have conferred upon me by this cordial reception. I have nothing further to say, on the present occasion, than to add that I have come to Chicago more especially to attend the Seventh Meeting of the International Pharmaceutical Congress, which takes place next week.

Mr. Weston, of London, and Mr. Henry M. Martin, of Newcastle, England, were also introduced, and the latter addressed the Association as follows:

Mr. President and Gentlemen: I thank you for your kind reception, and must apologize for having unintentionally interrupted the proceedings, which are of great interest

to me. Of course, I am a member of the Pharmaceutical Society of Great Britain, but I prefer, at present, to attend here as a member of this Association of which I have heard so much.

Mr. Fennel, in behalf of the Committee, presented the report on credentials, which showed that delegates had been accredited from the following organizations:

Colleges of Pharmacy.—Brooklyn, California, Chicago, Cincinnati, Louisville, Maryland, Massachusetts, National, Ontario, Philadelphia, St. Louis, and the Departments of Pharmacy of Detroit College of Medicine, Northwestern University and Tulane University.

State Pharmaceutical Associations.—Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Virginia, Washington, Wisconsin and Quebec.

Local Associations.—Cleveland, Ohio, and Kings Co., N. Y.

Alumni Associations of Colleges of Pharmacy.—California, Chicago, Cincinnati, Louisville, Maryland, Massachusetts, National, New York, Philadelphia, St. Louis, and Pharmacy Department Tulane University.

Furthermore, credentials were received from the American Medical Association, National Wholesale Druggists' Association, and from the Pharmaceutical Society of Great Britain; also from the Pharmacy Boards of Kentucky and Wisconsin.

On motion, the courtesies of the floor were extended to the visiting delegates.

Mr. Sheppard read his annual report (see page 26) and Mr. Kennedy the report of the Auditing Committee (see page 25).

The report of the Chairman of the Council on Invested Funds was next read and approved.

ST. LOUIS, MO., *July* 1, 1893.

The invested funds in the hands of the Chairman of the Council consist of the following:

Ebert Fund.

U. S. registered 4 per cent. bond, $100.00, No. 160,603	$110.00
" " " " 500.00, No. 67,880	550.00
Cash, Savings Bank, Dover, N. H.	64.18
	$724.18

Centennial Fund.

U. S. registered 4 per cent. bond, $1000.00, No. 145,640	$1100.00
" " " " 100.00, No. 160,604	110.00
Cash, Savings Bank, Dover, N. H.	138.82
	$1398.82

Life Membership Fund.

U. S. registered 4 per cent. bond, $1000.00, No. 145,639	$1100.00
" " " " 1000.00, No. 145,761	1100.00
" " " " 1000.00, No. 145,762	1100.00
" " " " 1000.00, No. 150,826	1100.00
" " " " 1000.00, No. 150,827	1100.00
" " " " 1000.00, No. 150,828	1100.00

U. S. registered 4 per cent. bond, $1000.00, No. 164,185	$1100.00
" " " " 1000.00, No. 164,889	1100.00
" " " " 1000.00, No. 173,049	1100.00
Cash, Savings Bank, Dover, N. H.	162.47
	$10062.47

General Fund.

American Security and Trust Co. 5 per cent. debenture bond, No. 26	$1000.00
" " " " " No. 27	1000.00
" " " " " No. 28	1000.00
	$3000.00
Total invested funds.	$15185.47

J. M. GOOD,
Chairman of Council.

Mr. Sheppard offered as an amendment to the Constitution, which will lie over until next year for action, to strike out, in the second line of Article III., the words "a local secretary," and then add to Article III. the words, "also a local secretary to be elected by the Council."

On motion of Mr. Oldberg, the President of the Association was requested to send greetings to the British Pharmaceutical Conference, in session at Nottingham, England, and wish them success at their meeting.

Mr. Kennedy read the report of the Committee on Prizes (see page 15), which, on motion, was adopted.

MR. EBERT: I notice that the sum provided is $150 a year. I would ask whether the Council has approved of this?

MR. KENNEDY: Yes, sir.

MR. EBERT: I have nothing to say concerning the matter, except that we should not spend any more money than we are obliged to.

MR. GOOD: I would call Mr. Ebert's attention to the fact that there is a saving clause there, "if worthy papers be presented." We are not compelled to give the prizes unless we feel that the papers are eminently worthy, and I think the finances will justify it.

Mr. Whelpley, on behalf of the Committee on the Revision of the United States Pharmacopœia, stated that the Pharmacopœia has not been issued for a sufficient length of time to enable the Committee to make any extended criticisms or great laudations of the publication.

Mr. Oldberg presented the following report of the Committee on the International Pharmaceutical Congress, which, upon motion, was received and referred to the Committee on Publication:

CHICAGO, *August* 14, 1893.

To the President of the American Pharmaceutical Association:

The Committee on the International Pharmaceutical Congress begs leave to report as follows:

Since the annual meeting of 1892 the Committee has continued to perform such duties as were required in furtherance of the objects for which it was appointed. Invitations were issued by the President and Permanent Secretary of the American Pharmaceutical

Association to pharmaceutical bodies and individual pharmacists throughout the world to attend the Congress by delegates or in person, and a preliminary announcement, touching the objects, organization and programme of the Congress, was prepared by this Committee and promulgated with the official invitation already herein referred to. The invitations, as well as the preliminary announcement, are herewith submitted as part of this report and explain themselves. It will be seen from the preliminary announcement that the World's Congress of Pharmacists projected by the World's Congress Auxiliary of the World's Columbian Exposition and the Seventh International Pharmaceutical Congress have been merged into one with the approval of the Council of the American Pharmaceutical Association, and the Congress will meet next Monday, August 21st, in the Art Palace, Chicago.

As the duties of your Committee have not yet been concluded, this report is to be regarded simply as a report of progress.

Respectfully submitted, OSCAR OLDBERG, *Chairman.*

THE INTERNATIONAL PHARMACEUTICAL CONGRESS, CHICAGO, UNITED STATES, AUGUST 21, 1893.

PRELIMINARY ANNOUNCEMENT.

Its Objects, Organization, and Programme.

1. The International Pharmaceutical Congress called to convene in Chicago, August 21, 1893, during the progress of the World's Columbian Exposition, will be the seventh in the series of International Pharmaceutical Congresses, and the first held in America.

In addition to the invitation extended by the American Pharmaceutical Association to the International Pharmaceutical Congress to hold its next meeting in 1893 in Chicago, a proposal was also made by the World's Congress Auxiliary of the World's Columbian Exposition to the pharmacists of the world, inviting them to participate in the Columbian commemoration by a convention similar in scope to the other world's congresses to be held at the same time and place, the proceedings of which will, in part, be devoted to addresses and papers of a general and popular character, including brief reviews of the progress made since the days of Columbus. It was, however, deemed desirable that there shall be but one pharmaceutical congress held this year, and that the scope and objects of the proposed World's Congress of Pharmacists and those of the Seventh International Pharmaceutical Congress be merged, and to attain this end the World's Congress Auxiliary accordingly proposed that the programme of the International Pharmaceutical Congress at Chicago include addresses and papers of a historical nature, and afford opportunity for the presentation of such other topics of a general interest as may, in the judgment of the Committee on Arrangements, be appropriate to the occasion. This proposal having been agreed to, the International Pharmaceutical Congress will be the only world's congress of pharmacists held in Chicago during the Exposition season.

The general scope and objects of the International Pharmaceutical Congress will be to stimulate pharmaceutical progress, to discuss the status of pharmacists and promote an intelligent appreciation of the work they do, and to consider matters and measures affecting the further advancement of pharmacy and a nearer approach to international agreement in education and practice.

2. A committee on the International Pharmaceutical Congress has been appointed by the American Pharmaceutical Association to arrange the preliminaries. This Committee on Arrangements consists of Oscar Oldberg, Chicago, Chairman; N. Gray Bartlett, Chicago; C. Lewis Diehl, Louisville, Ky.; D. R. Dyche, Chicago; Albert E. Ebert, Chicago; C. T. P. Fennel, Cincinnati, Ohio; J. M. Good, St. Louis, Mo.; C. S. N. Hallberg, Chicago; L. C. Hogan, Chicago; J. N. Hurty, Indianapolis, Ind.; J. Kochan, Denver, Col.; E. Kremers, Madison, Wis.; A. L. Metz, New Orleans, La.; Charles

Mohr, Mobile, Ala.; E. L. Patch, Boston, Mass.; A. B. Prescott, Ann Arbor, Mich.; Charles Rice, New York, N. Y.; E. H. Sargeut, Chicago; William Saunders, Ottawa, Can.; L. E. Sayre, Lawrence, Kan.; William M. Searby, San Francisco, Cal.; William Simon, Baltimore, Md.; William Simpson, Raleigh, N. C.; William S. Thompson, Washington, D. C.; together with Joseph P. Remington, Philadelphia, Pa., President of the American Pharmaceutical Association, and John M. Maisch, Philadelphia, Pa., Permanent Secretary of the American Pharmaceutical Association.

All who intend to participate in the Congress or to be represented or present in its meetings, and all invited guests, are requested to communicate in advance, and, if possible before July 1, their names and addresses to Oscar Oldberg, Chairman of the Committee, 2421 Dearborn Street, Chicago.

All papers, reports, and communications to be read at the Congress will, as far as possible, be printed in advance, in order that copies may be distributed at the meeting. For this purpose, such papers, reports, and communications must be placed in the hands of the Permanent Secretary of the American Pharmaceutical Association, John M. Maisch, 145 North Tenth street, Philadelphia, before July 20. If received later, the printing in advance of the meeting cannot be promised.

3. The Congress will be constituted of delegates accredited for that purpose by the governments of the different countries, the pharmaceutical societies and examining boards, the colleges and schools of pharmacy, the pharmaceutical departments of universities, and the national pharmacopœial committees or commissions, respectively, each of which bodies will be entitled to be represented by three delegates.

4. Special invitations are extended to pharmaceutical teachers, authors, leaders in the pharmaceutical profession, and pharmacists generally, to seats in the Congress.

5. When a vote shall be taken upon any question upon which the yeas and nays shall be called, only duly accredited delegates shall be entitled to vote.

6. The officers of the Congress shall consist of a President, Vice-President, a Secretary, and three Vice-Secretaries. The Committee on Arrangements shall act as a Nominating Committee, and shall nominate the officers by ballot. The number of Vice-Presidents to be nominated shall be determined by the Nominating Committee.

7. The first session of the Congress will be opened at 9 o'clock A. M., on Monday. the 21st day of August, 1893, in the Memorial Art Palace, Chicago, in which commodious halls and accommodations have been placed at the disposal of the Congress through the courtesy of the World's Congress Auxiliary of the World's Columbian Exposition.

The Congress will be opened with appropriate ceremonies, official addresses of welcome, and a report of the Committee on Arrangements. A temporary organization will then be effected and a Committee on Credentials appointed.

Following this will come the adoption of regulations for the government of the Congress and its proceedings, and the reception of official communications and invitations.

The Nominating Committee will then report the nominations for officers, after which the election of officers will follow.

8. The proceedings of the Congress will be conducted in the English language; but when participants in discussions speak in German, French, Spanish, or Swedish, interpreters will translate these languages into English. Addresses, papers, or communications printed or published by the Congress will be published in English, German, French and Spanish.

The publication of the Proceedings will be intrusted to a special committee, to be appointed by the President of the Congress.

To defray the expenses attendant upon such publication, each member from the United States or member of the American Pharmaceutical Association who may take part in the Congress will be required to pay the sum of five dollars; no assessment to be made upon other members or visitors.

9. To facilitate the conduct of the proceedings of the Congress, the Committee on Arrangements will classify the business according to the subjects, and the Congress will for that purpose be arranged into four sections, as follows:

Section I. Historical and Ethical Pharmacy.

Section II. Pharmaceutical Education and Legislation.

Section III. Pharmacopœial Matters.

Section IV. General Section, embracing pharmaceutical questions and subjects not assignable to any of the three preceding sections.

The order of business after the election of officers will be in conformity with this classification.

SUBJECTS PROPOSED FOR PAPERS, REPORTS, AND DISCUSSION.

Section I.—Historical and Ethical Pharmacy.

1. The condition of pharmacy four centuries ago as contrasted with its present status.

2. The history of pharmacy and pharmaceutical institutions in the United States.

3. The ethics of the practice of pharmacy, and the mutual relations between physician and pharmacist and between pharmacists and the public.

4. The influence exerted upon the practice of pharmacy by the introduction of chemicals and other medicinal substances controlled or limited by patents, copyrights, trademarks, or other legal restrictions, but which are commonly ordered by physicians in their prescriptions.

Should such limitations as foster monopoly in the manufacture and sale of such products be removed in the interest of the public good?

5. The relations of pharmacists to public sanitation.

6. Statistics of the present number of pharmacies in proportion to population in various countries, and of imports and exports of crude drugs, medicinal chemicals, and pharmaceutical preparations during the last half-century.

Section II.—Pharmaceutical Education and Legislation.

1. Statistics giving the number of schools or colleges of pharmacy in each country, and the total number of students pursuing pharmaceutical courses.

2. How do the education and the professional and social position of pharmacists compare with those of other professions?

3. What legislation, if any, is at present most needed for the advancement of the best interests of pharmacy?

4. To what extent is official supervision of drug stores necessary or beneficial?

Section III.—Pharmacopœial Questions.

1. The proper scope of a national Pharmacopœia.

2. What improvements, if any, are desirable and practicable in pharmacopœial nomenclature? Is a nearer approach to international uniformity possible?

3. What would be an ideal pharmacopœia?

4. What progress has been made towards the preparation of an international Pharmacopœia for potent remedies?

What action, if any, should be taken in reference to this subject?

5. Have the influence and co-operation of pharmacists increased in the work of pharmacopœial revision in the various countries? What proportion of the membership of the Pharmacopœial Revision Committee or Commission of your country consists of pharmacists?

6. Should any substance, the manufacture or sale of which is restricted by any patent, copyright, or trade-mark, be admitted into any national Pharmacopœia? If so, under what conditions?

7. What consideration should determine the introduction into the Pharmacopœia of a new remedy, or the retention or rejection of one already in it?

Section IV.—General Section.

1. Upon what general plan can a systematic pharmaceutical nomenclature of the complex organic chemicals recently being introduced into the Materia Medica (such as antipyrine, etc.,) be constructed ?

2. In what directions may the pharmacist profitably extend his technical and professional work, to render him less dependent upon the purely mercantile part of his business ?

Papers upon these and other subjects which may be presented and accepted will be referred to their appropriate Sections.

Mr. Fennel: The American Pharmaceutical Association has done everything possible toward making the Seventh International Pharmaceutical Congress the largest and best attended that has ever been convened. All former congresses have made every effort to establish an international Pharmacopœia. Thus far, however, the movement has not been attended with success. We as Americans have just issued a new Pharmacopœia which is second to none. We all admit it and recognize that it is, to-day, the Pharmacopœia of the world. Now, in consideration of this, I hope that the Association will take this matter in hand; and, to further the interests of an international Pharmacopœia, I offer the following resolution:

Reeolved, That the sum of one thousand dollars be and is hereby appropriated to be placed at the disposal of the Seventh International Pharmaceutical Congress by the Council of this Association, for the compilation, publication and distribution of an International Pharmacopœia.

Mr. Sayre: I think it would be best for every member to look into this matter before acting upon it. Perhaps one thousand dollars may not be enough. I therefore move taht this resolution be referred to a committee of three, to report at a future session, rather than put it to a vote just now.

Mr. Oldberg: I suppose that Mr. Fennel intended to move that this appropriation be made for the purpose of preparing and publishing an international Pharmacopœia of potent remedies only; not the kind of an international Pharmacopœia which was at first contemplated by the International Pharmaceutical Congress, but which later congresses have endeavored to finish and publish. If that is the intention I am very heartily in favor of his proposition, and I think that perhaps the Association is just as ready to take action now as it will be at any other session. The subject of an international Pharmacopœia of potent remedies has been before us for many years, and I know that one of the reasons why the work was not finished was the want of means. Certain men in the American Pharmaceutical Association see fit to make this appropriation now, and I understand that the work will be very substantially furthered if the plan is adopted, and will, in fact, be accomplished as soon as practicable. Therefore, we ought to take action upon the resolution now, and I hope that the appropriation will be made.

Mr. Sheppard: Professor Sayre remarked a moment ago, that perhaps one thousand dollars might not be enough. I think that one thousand dollars is all that we, as an Association, ought to appropriate; and I think that it will be sufficient, because if more should be needed—and that is very probable—the fact that we have made the first advance in giving such a comparatively large sum of money will draw towards the object contributions from various other sources. Therefore, I do not think that this Association should appropriate a larger amount of money than is named in the resolution.

Mr. Martindale: As a stranger, I thank you for the great liberality with which you grant this sum, but let me ask you to pause. I would not like to see an abortive scheme

brought up. We have had two international Pharmacopœias proposed at meetings of the International Congress, and I hardly think that it is the duty or business of the American Pharmaceutical Association to quite take this matter in hand, if you will pardon me for making this suggestion. I imagine that at the meeting next week a committee or something of that kind will be formed to take the whole subject into consideration. I certainly believe with Professor Oldberg, that it should be a Pharmacopœia of potent remedies rather than an ambitious scheme, which would be a visionary one. I agree with the principle of the proposition, that we should have uniformity in the strength of the active galenical preparations. Travelers from the United States visit Europe and want prescriptions, and it is the same in the United States with respect to European travelers, and we ought to have, especially in regard to opium, uniformity throughout the world. I have attended two International Pharmaceutical Congresses—those of Paris and London—and at the last one two schemes were brought forward, both of which proved abortive. A compilation was presented to the Congress which did not meet with approval, and I should be sorry to give your American Association all this labor without the International Pharmaceutical Congress taking the matter in hand.

MR. FENNEL: Any one who is acquainted with the proceedings of both the Fifth and Sixth International Congresses is well aware of what has been done. At the Fifth, a general international Pharmacopœia was presented by the French delegates, incorporating everything that was customarily used in the various countries represented at the Congress. The impracticability of such a Pharmacopœia was immediately perceived, and at the Sixth International Congress means and methods were devised to control nothing but potent remedies. Now, in all probability, the Seventh International Congress will follow in the footsteps of the Sixth, and finish that work. It takes a little money to do the work. The American Pharmaceutical Association has funds; and, therefore, I brought in the resolution to appropriate a certain sum to this Congress, without any dictation as to what shall be contained in the Pharmacopœia, nor as to who shall constitute the committee to take charge of the money. The International Congress will be able to take care of itself, and it will not squander money that may be appropriated for its benefit by the American Pharmaceutical Association.

MR. SHEPPARD: Possibly some misunderstanding may have occurred from the remarks that have been made, and I would like to have it understood what the intention of Professor Fennel's motion is. We do not dictate to the Pharmaceutical Congress, nor ask them to make a certain Pharmacopœia, but if they choose to compile an international Pharmacopœia of any sort (I shouldn't say potent remedies or anything else) the American Pharmaceutical Association will assist to the extent mentioned in the resolution.

MR. SAYRE: If there is anything I like about the American people it is their liberality. When we go abroad we sometimes hear Europeans saying: "Well, the Americans know how to spend their money." That is their reputation, and I think that our foreign friends will say the same thing when they go home. We are giving them money, for what purpose we do not know; that is exactly the fact. One speaker says it is for a Pharmacopœia: another, a list of potent remedies. What are we giving the money for? I admire your liberality. I don't object to giving a thousand dollars—that is not my position—but if I give a thousand dollars to this Congress I want to do it with intelligence, and I simply ask you to appoint a committee to consider this question.

MR. FENNEL: The resolution states exactly what the money is for, namely, the compilation, publication and distribution of an international Pharmacopœia. If they do not issue an international Pharmacopœia they do not get the money; and if they do compile one and want to publish it, the American Pharmaceutical Association says, "We give you a thousand dollars to aid in the work."

MR. LLOYD: It seems to me that the International Congress ought to have the support of this Association. The delegates to that Congress will have nothing behind them. It is possible that at the meeting next week delegates from other countries may make a proposition to contribute a certain amount, and our delegates ought to have that privilege. I think it would be well for us to empower them to say that we will contribute one thousand dollars, if necessary.

MR. SAYRE: I am glad that the proposition comes from the formulary man, Mr. Fennel, and another representative man, Mr. Oldberg. One says formulary, the other potent remedies. I wish to leave out the words "international Pharmacopœia," and be more general still.

MR. MARTINDALE: If this international Pharmacopœia were published by the International Pharmaeutical Congress, what authority would it have as an international Pharmacopœia ?

PRESIDENT REMINGTON: Simply as having come from the Seventh International Pharmaceutical Congress—whatever authority the Congress would have in being back of of such a work. The resolution seems to be worded in a very careful way, so as to cover the complications which are likely to arise. At the same time, the appointment of a committee does not interfere with the passage of the resolution in any way. There are two distinct propositions with regard to this resolution. One is to pass upon it now; the other is to refer it to a committee, and let it come up at the final session.

MR. EBERT: I would say that we have a body in this Association styled the Council, which looks after our money matters. If you are going to contribute one thousand dollars for the benefit of the Congress, let the money remain in the hands of the Council, who are officers of this Association, and responsible to us for the money. Do not let the money go out of the Association's hands until it appears that we are going to derive some return for it. I offer to amend the resolution by appropriating one thousand dollars, and placing in the hands of the Council for them to do what is right in the matter.

Mr. Ebert's amendment having been duly seconded, was put to a vote, and was carried. With this amendment the resolution was adopted.

Mr. Kennedy presented seventeen applications for membership, which had not been acted on by the Council. On motion, the applicants were duly elected.

Mr. Sheppard moved that the By-laws be amended by striking out Section 5, Article II, and then changing the numbers of Sections 6 to 10, Article II, so as to read Sections 5 to 9; action to be taken at the final session.

Secretary Whelpley read an invitation from the general officers of Armour & Co., inviting the Association to visit the packing houses, and stating that a private car would be provided for the accommodation of members. Also, a letter from the representative of Merck & Co., at the World's Fair, extending the hospitality of the Merck Building to all members; and an invitation from the Illinois College of Pharmacy, inviting members to call and inspect the new college building, laboratories, etc. On motion, the invitations were accepted with thanks.

The President announced a communication from Dr. Rice in relation to the Pharmacopœia, which was accompanied by two additional copies of

the Pharmacopœia, one copy bound in cloth, showing the style of binding employed, the other illustrating the method of presenting the Pharmacopœia. The latter copy is printed on only one side of the page, so that all through the work there is an alternate blank page on which notes can be made. This copy is left unbound, so that a few pages can be taken out for any desired purpose.

Secretary Whelpley read the letter referred to, which was as follows:

NEW YORK, *August* 10, 1893.

PROF. JOSEPH P. REMINGTON,

President American Pharmaceutical Association:

DEAR SIR: Official duties requiring my immediate attention having rendered it impracticable for me to visit Chicago at the present time, I would request that you announce to the American Pharmaceutical Association, on behalf of the Committee of Revision and Publication of the Pharmacopœia of the United States of America, the fact that the new revision is completed, and is on the point of being distributed throughout the country. Also, that you present to the Association, for the inspection of the members, the copies of the work which have been forwarded to you.

It is the hope of every member of the Committee that the new work will be found to be worthy of the support of the whole profession, not only of pharmacy, but also of medicine, and that every member of the American Pharmaceutical Association will do all he can to adhere to, or to secure adherence to, its standard and directions, as far as may be possible.

The Committee will thankfully receive any and all suggestions for further improvements, and would recommend that the several committees on the Pharmacopœia, which have already been appointed, or may hereafter be appointed, by the American Pharmaceutical Association, or by State Pharmaceutical Associations, forward copies of their annual reports directly to the Chairman of the Committee on Revision.

Very respectfully,

CHARLES RICE.

Chairman of the Committee of Revision and Publication of the Pharmacopœia of the United States of America.

On motion, the Association then adjourned, giving place to the sessions of the various Sections.

THIRD SESSION—SATURDAY MORNING, AUGUST 19.

President Remington called the Association to order at 9:30 o'clock A. M. The minutes of the second general session were read by the Secretary, and on motion approved.

The Secretary read the minutes of the Council, and on motion they were approved. The business transacted by the Council was as follows:

FOURTH SESSION OF COUNCIL—ART INSTITUTE, AUGUST 15. Present, 10 members.

The applications for membership were examined and referred to the Association.

Council went into caucus, prior to re-organization, and agreed upon the following officers: J. M. Good, *Chairman*, H. M. Whitney, *Vice Chairman*, and George W. Kennedy, *Secretary*.

Upon going into regular session, the adoption of the following resolution was moved and seconded:

Resolved, That it is the sense of the Council that the duty of Acting Secretary Whelpley consists in preparing the records of all the general sessions of the Association and sending the same to the Permanent Secretary; his compensation therefor to be $50.00 and his expenses of attending this meeting.

FIFTH SESSION OF THE COUNCIL—WORLD'S FAIR GROUNDS, AUGUST 16. Present, 6 members.

In the absence of the Secretary, H. M. Whelpley was appointed Secretary *pro tem.*

Upon motion, the following addition to the General Rules on Finance was adopted: No money shall be taken from the Entertainment Fund, except by special vote of the Council.

Two applications for membership were presented, and directed to take the usual course.

The motion of C. T. P. Fennel, which was seconded by P. C. Candidus, that the vote passed last year, laying an assessment of $5.00 on each American member of the International Pharmaceutical Congress, be and the same is hereby rescinded, was carried.

Reports of committees being called for, Mr. Whitney, on behalf of the Committee on President's Address, presented the following report:

REPORT ON PRESIDENT'S ADDRESS.

Gentlemen of the American Pharmaceutical Association:

Your committee have carefully considered the President's address, and with one exception, named later, commend the suggestions as most wise and timely. This meeting is perhaps the most important in the history of the Association, immediately preceding as it does the International Pharmaceutical Congress and the issue of the U. S. Pharmacopœia for 1890. We desire to congratulate the Association that the "universal fitness of things" was maintained when he was selected as the man for this occasion, for surely no one could have given us so much information regarding the new Pharmacopœia, or so fittingly represented the American Pharmaceutical Association on this occasion.

We emphasize his congratulations to the Committee of Revision and Publication of the United States Pharmacopœia.

We desire especially to join with the President in his implied confidence that "the wisdom of our Commercial Section can be trusted to pilot the Association in a safe course in these troublous waters."

The recommendation that the name of the National Formulary "be changed to the American Formulary" we do not endorse, fearing the change will lead to confusion and annoyance, and being assured that when the words "issued by the authority of the A. P. A." as suggested by the President, are attached to the name "National Formulary," the results desired by the President will be secured.

The publishing of the Proceedings in pamphlet form as at present we heartily approve.

Respectfully,

Signed,

H. M. WHITNEY,
C. LEWIS DIEHL,
H. R. SLACK.

On motion of Mr. Sheppard, the report was received and referred for publication.

THE PRESIDENT: There will meet in the city of Washington, in September next, a very important international congress, namely, the Pan-American Medical Congress.

The chair has received from the Secretary General of this Congress a communication, inviting this Association to assist in the formation of a Section on Pharmacology and Materia Medica at the Congress, similar to the one maintained by the American Medical Association. I accepted the invitation on the part of the Association, and stated that delegates from this body would be sent to Washington. The importance of the Pan-American Medical Congress lies in the fact that it is very desirable for us to cultivate better relations, both scientifically and commercially, with our neighbors in South America, and this object is furthered by such an international meeting as this. I felt that the American Pharmaceutical Association would be in accord with this sentiment, and as there was no time to bring the subject before the Association before replying to the secretary of the Congress, I decided to accept the invitation. If there is no objection to this action, the Chair would announce the delegates to the Pan-American Medical Congress.

Mr. Rogers moved that the President's action be endorsed, and that he be instructed to appoint a committee to visit the Pan-American Medical Congress.

Carried.

The chair thereupon appointed on this committee, Messrs. W. S. Thompson, Chairman, Chas. Caspari, Jr., and F. G. Ryan.

The next business before the Association was the appointment of a committee to award the Association prizes for meritorious papers, upon which action was taken at the second general session. The chair appointed on this committee, Messrs. J. M. Good, W. J. M. Gordon, and J. H. Stein. The committee's report, it was stated, would be made to the Council after the Association had finally adjourned, because adequate time would be required to examine the papers carefully.

Mr. Whelpley made the following motion:

"That the President be instructed to appoint a special Committee on Membership, to consist of one member from each State and territory and one each from the District of Columbia, Nova Scotia, Ontario and Quebec, the duty of said committee to be that of soliciting new members in their respective sections of the country, and to report the same to the Secretary of the Committee on Membership."

The motion was seconded and carried.

Mr. Eliel: *Mr. President and Members of the Association:* I desire to bring a matter before you, which, I believe, calls for your serious attention. I hardly know in what form it should be presented, but in order that you may understand it, I will merely recite the facts upon which I propose to base charges against a member of this Association. On Thursday morning last, at the first session of the Section on Pharmaceutical Education and Legislation, a very interesting paper was read by the Chairman of that Section. This paper was contributed by one of the charter members of this Association. It was a very able paper, and was exceedingly well written. It not only gave a history of the Pharmacopœia from its first inception down to the present time, but described the mode of organization of the various Colleges of Pharmacy, and of the several Pharmaceutical Associations of this country. When the paper was concluded, the Chairman asked whether any member present had any remarks to make with reference to it, in the shape of suggestions or criticisms. Nothing of that kind was offered; but I am sorry to say that a member of the Association arose and made this remark: "Well, the gentleman doesn't incorporate anything in his paper about the progress of the saloon during this

time." Now, I take it, Mr. President and members of the Association, that a remark of this kind was an insult to the gentleman who wrote the paper, and an affront to the Association. This Association is composed of gentlemen, and we have no place in our membership for any one who is guilty of making such a remark as the one quoted, at such a time, or at any other time. We are obliged, gentlemen, to take remarks of this kind from the alleged funny scribblers for the daily press and others. We are powerless to defend ourselves from these slanders; but we are in position to resent an insult of the kind when it is deliberately offered on our floor. I, therefore, move that the member who made the offensive remarks be expelled from membership in this Association.

MR. SHEPPARD: *Mr. President:* While I would not say a word in excuse and palliation, in any way, for the words used by the member, which I think are offensive, still I think we ought to take into account the fact that he immediately arose and said that he apologized for the expression, which he intended merely as a joke.

MR. ELIEL: Are we obliged to listen to such slurring remarks as this and overlook them solely, on the ground that they are jokes? Mr. Major is not a pharmacist; he is not connected, in any way, with the practice of pharmacy, and never has been. He is simply a maker of glue.

MR. CASPARI: I don't wish to say very much in connection with this matter, but I was present when the offensive remark was made, and I really think myself that it should be construed as an insult to the writer of the paper, Mr. Colcord, as well as to the Section on Pharmaceutical Education and Legislation, representing this Association. It is high time, I think, that these so-called jokes were laid aside in matters of such serious import. It may not be advisable to take such an extreme step as that indicated by Mr. Eliel, but I think that Mr. Major should be severely called to order by the proper authorities for his objectionable remarks.

MR. ROGERS: In order to dispose of this matter for the present, I move that it be referred to the Council, which shall have power to act as may be thought best, and if necessary, to expel the offender from this Association.

The motion was seconded and carried.

Mr. Sheppard offered the following:

Moved that the Local Secretary be made Chairman of the Committee on Arrangements for the meeting of 1894, and that he be instructed to appoint the other members of said Committee.

The motion was carried.

SECRETARY WHELPLEY: The following amendment was proposed at the Second General Session by Mr. Sheppard: "Moved that the by-laws be amended by striking out Section 5, Article xi., Chap. ix., and then changing the numbers, Sections 6 to 10, Article xi., so as to read, Sections 5 to 9."

MR. SHEPPARD: In explanation of this proposed amendment, I would say that it is merely carrying out the action taken a year or two ago, when we adopted the plan of posting up the names of members instead of reading them, thereby avoiding the delay of reading them twice in our meetings. We amended the previous article, and had it read in this way: "The Council shall read the person's name to the Association and post the name in a suitable place in the hall before the beginning of the session," and we did not, as was intended at that time, strike out another section which declared that the Council should also read the names of the candidates for membership. When this first amend-

ment, to post the names, was adopted, it was intended to remedy the evil which this other section continues, that is, the time occupied in reading the names twice over, and is merely a matter of verbiage. Striking out that section does not, in any way, affect the mode of election which we are now following.

A vote was taken on the amendment, which resulted in its adoption.

MR. SHEPPARD: I now move that when we adjourn we adjourn to meet in the city of Asheville, N. C. on the first Monday in September, 1894.

Carried.

THE PRESIDENT: Before proceeding with an further business, it is my desire to present to the Association a gentleman who has taken a great interest in the relations existing between pharmacists and physicians—a gentleman who three years ago, sent to this Association the first invitation from the American Medical Association to send a delegation of twenty-five to the meeting of that body in Washington. He comes before this Association as the duly accredited delegate from the American Medical Association, the national organization of physicians in this country. I take pleasure in introducing to you Dr. Frank Woodbury, of Philadelphia. (Applause.)

DR. WOODBURY: *Mr. President, members of the American Pharmaceutical Association:* I have come here as a representative of the American Medical Association, to bear to you a cordial message of amity and good will, and of mutual regard. Having conveyed this message, my duty is fulfilled as far as my official connection is concerned; but I will avail myself of your indulgence for a few moments to personally express the appreciation of the American Medical Association, and in particular that of the Section on Pharmacy and Materia Medica, which I have the honor to represent, and of which I have had the honor to be Chairman for the last three years. I desire to say how much we appreciate the interest you have taken in our Association, in sending a delegation which has constituted, this year, the principal working force of the Section on Pharmacy and Materia Medica. We hope soon to further interest the physicians of the American Medical Association in the work of that Section, and it takes time for a new enterprise to become rooted, but when it is well rooted we expect that it will grow and flourish and bring forth fruit.

I need not refer to the standing of the American Pharmaceutical Association in the esteem of the physicians of the United States. It has shown for itself in its annual volume of Proceedings, and in the work it is doing, what it is capable of accomplishing for scientific medicine. The pharmaceutical branch of the medical profession is handicapped, however, by an unfortunate title, in my estimation, that of simple Graduate in Pharmacy. The capable pharmacist should have the title of Doctor as well as the practicing physician, for he is entitled to it. Pharmacy is a branch of the medical profession. but the necessary consequence of the development of any science and of increasing knowledge in any department, is the division of it into branches, and that has occurred in the study and practice of medicine in the United States. At the present day there are very few physicians who go out into the fields and gather their own simples and manufacture their own crude products from them for dispensing to their patients. There are, it is true, still a few left, but they are very few and constitute the exception. The American medical profession leans on the pharmaceutical profession, and depends upon it for progress in pharmacy and in scientific preparation of medicine. This assistance the American pharmaceutical profession has rendered, and in order that it shall advance in the respect of the community and hold the position that it is striving to attain, it is necessary that it should protect itself by exercising a moral authority over the pharma-

cists of the United States to keep them in their own field. In that way, if any one comes to a practicing physician for pharmaceutical information, the physician has no hesitation in saying, "I am not a pharmacist; I cannot answer that question, but must refer you to Mr. So and So (Dr. So and So, it should be), who is a specialist in that field." In the same way, when some one comes to a pharmacist for information on a point in practical therapeutics, the pharmacist should be proud enough of his profession to say, "I am not a practicing physician; I am a pharmacist." By thus establishing his position as a pharmacist in the community, the pharmacist rates himself by the side of the practicing physician, and in his own field he is superior to the practicing physician, Each should respect the department of the other, and in that way learn to respect each other.

To accomplish this desirable result, it seems to me that the American Pharmaceutical Association might lay special stress, in the future, upon the cultivation of the scientific aspects of pharmacy, and should be able to restore to pharmacists the old English title of chemist and druggist, and chemist first. The science of practical therapeutics has advanced to such a degree that physicians are unable to devote to chemical investigations, microscopic investigations and the other necessary investigations in clinical medicine, the vast amount of time needed for their proper study. The physician needs such assistance as the skilled pharmacist and the cultivated chemist can give to him, and it seems to me that here is a field that the American pharmacist can look forward to, and may fill with credit to himself and with advantage to the science of medicine.

In conclusion, I would take one moment to express to you our sense of obligation and indebtedness for the great interest that your President, Professor Remington, has taken in cultivating feelings of friendship and mutual esteem between this Association and the American Medical Association. I think that he has achieved a triumph, and that the delegation from the American Pharmaceutical Association coming annually to the American Medical Association, and the American Medical Association, in turn, sending its representative to the American Pharmaceutical Association, marks an epoch in the history of pharmacy and medicine in this country, and the present meeting is therefore memorable in that respect. I wish to tender to him the thanks of the medical profession and my own for the efforts he has made to build up the Section with which I am connected, that of Pharmacy and Materia Medica. (Applause.)

THE PRESIDENT: The time has now arrived for the installation of the new officers of the Association. I will appoint Messrs. Gordon and Simon a Committee to conduct to the chair your newly-elected President, Professor Patch.

The President-elect having been duly installed, President Remington said:

PROFESSOR PATCH: It gives me a great deal of pleasure, on this occasion, to be the means of introducing you officially to the members of this Association. We have known you and have known of your work for many years, and we congratulate you upon receiving, at this time, this great honor. In handing to you the emblem of the office, which, by the way, happens to be very appropriate in your hands, I take special pleasure in saying that by practical work with your pestle, your burette and your pen, you have well earned the distinction of being elected to this, the highest office in the gift of the Association.

Gentlemen: I am sure that you will be proud of your new President, and in presenting to him the emblem of office, at this time, and at this meeting, I am sure you will regard with satisfaction and pleasure the fact that you have a President who will do you honor and ably fill all the duties required at his hands."

MR. PATCH: *Mr. President, Fellow Members of the Association*: If accidents ever happen, I suppose it is an accident which places me here as your President for the ensuing year. It has always been the rule of my life never to seek honor or preferment,

for three reasons: First, because life has always given me more to do than I can do well; second, I never would assume to possess qualifications which possibly I might be found destitute of, or lacking in; and, third, if one is called to any position which he does not seek, the responsibility of any lack or any failure on his part then devolves upon his constituency, and not upon himself. And yet, gentlemen, I do not lightly esteem the honor which you have conferred upon me in calling me to this position, which has been so graced, and so dignified, and so honored by previous incumbents that it cannot help but reflect honor upon any who may be chosen to fill it. And in thanking you for this unexpected token of appreciation and confidence, permit me at the same time to bespeak your kind consideration for any failure on my part, assuring you that it will not come from any intention, but from limited experience. I thank you, gentlemen.

Mr. Rogers, Second Vice President, was introduced.

MR. ROGERS: After listening to the eloquent addresses made by the retiring President and the President-elect, I am not inclined to take up much time in delivering a set speech. I simply wish to thank the Association for the honor bestowed on me in electing me to fill this office, and to give the assurance that I shall do every thing in my power to perform its duties in a satisfactory manner. Gentlemen, I thank you.

Mr. Caspari, Third Vice President, was introduced.

THE PRESIDENT: Once more I have the pleasure of introducing to you a gentleman who is known by his labors for this Association, Professor Charles Caspari, of the Maryland College of Pharmacy. He has been Chairman of the Scientific Section, has served on several important committees, and has been elected Third Vice President for the ensuing year.

MR. CASPARI: *Mr. President and Gentlemen:* Inasmuch as it is unlikely that the Third Vice President will ever be called upon to officiate in his capacity as Third Vice President, it will be unnecessary, I think, to inflict upon you profuse promises of faithful performance of duties. I accept the distinction you have conferred as a compliment tendered to the Maryland College of Pharmacy, and as the representative of that institution at this meeting, I offer you my thanks for the honor, which I sincerely appreciate.

Treasurer Sheppard was introduced.

THE PRESIDENT: You all know this hard-working member. I don't know whether the present financial stringency has affected his duties in any way, but I am sure that if his relations with you are as pleasant as they are with some of the officers of the Association and the Council, you will have cause to be well satisfied, and he will have no difficulty. I take pleasure in presenting Mr. S. A. D. Sheppard. Well and ably has he filled the Treasurer's office.

MR. SHEPPARD: *Mr. President and Fellow-members:* I thank you most heartily for this renewed expression of your confidence in me, but I know very well that it is not a speech of length or any smooth and polished words that you want from your treasurer, but that you simply want good judgment, long continued, steady, honest industry, and accurate work. I can simply say that I shall try, in the future, as I have in the past, to give you the best that I possess.

I rejoice, as does every member of the Association, in our strong financial position, and I certainly hope that we may continue to progress from better to best until our Association shall contain within its membership a large majority of all the best pharmacists in the United States; for I feel that while we have now about fifteen hundred mem-

bers, we ought to have three thousand, and I hope that every member will continue, in the future, as I know many have done in the past, to extend abroad the good name of our Association and thereby draw to us the best pharmacists in the land; for with a stronger financial position we all recognize the fact that we shall have the power to do far greater work for the good of pharmacy than can otherwise be possibly done. Again, gentlemen, I thank you.

Mr. Henry Kraemer, Reporter on the Progress of Pharmacy, was introduced by the President, who said: "That the work of the reporter on the Progress of Pharmacy has been well done, we have received ample proof. I am sure that he will give service in the future that will be equally satisfactory."

MR. KRAEMER: *Mr. President and Gentlemen:* I would very much like to extend the work that I have undertaken for you during the past year. I thank you heartily for my re-election to this most important office. To those of you who were present at the second general session, when I read my preliminary report, the responsibilities, the possibilities, and the careful attention needed to properly fill that position must have been very apparent. It is for that reason that I ask your support, for I need your help to make the work the success I have had in view. I have only given you an idea. The suggestions which I have offered will be brought before the Council for consideration, and I shall be satisffed with whatever action the Council may decide to take.

I want you to read my preliminary report, I want you to read the report in full when it is in your hands, I want you to think over the work and to think of the vast amount of information that should be gathered together, each year, for the benefit of the Association. I therefore sincerely beg of you to look over that work and study it carefully. While you may look upon me as a young man, filled with intense enthusiasm, I feel, nevertheless, that I have some of the older members close at hand who will endeavor to modify that, if necessary, and control it. In my work, therefore, I shall be unbounded in my enthusiasm, I shall not ignore the vast possibilities which I see before me, and shall give you whatever advantages there may be in the bright rays of hope and of promise that I see ahead. Although there may be some who will endeavor to chill the fervid enthusiasm which I feel in this work, yet I know that upon the whole there will be united support, united help. To that end, I want you to read the report carefully, read the suggestions carefully, and write papers for the journals, next year, so as to aid in this work. Write to me personally, making suggestions as to how I can improve upon the work that I have presented; and finally, gentlemen, I hope that some of you at our next meeting will contribute papers showing how the report on the Progress of Pharmacy may be made more valuable, and thus obtain recognition as the standard work of its kind in the world of science. I thank you, gentlemen, most heartily for my re-election to office, and hope that I may be enabled to do the work to your entire satisfaction.

THE PRESIDENT: There is one name on this list to which there will be no response —the name of Professor John M. Maisch, our Permanent Secretary. The President and Secretary, however, have received a communication from Professor Maisch, which, if read at this time, I think will be a source of great satisfaction to the members of the Association, and will be the best introduction that Professor Maisch can have at this meeting.

The Secretary read the following message from Secretary Maisch:

PHILADELPHIA, *August* 16, 1893.

MESSRS. FRED. HOFFMAN, A. E. EBERT AND G. A. ZWICK.

Gentlemen: I would request you, as the Committee which sent to me the kindly

greeting of the American Pharmaceutical Association, to express to that body my heartfelt thanks for its expression of sympathy, and its acknowledgment of my efforts in the cause of pharmacy.

If those kind words are the sentiment of the profession, then surely I may entertain the hope, which at this time of trial and suffering is a consolation and a satisfaction to me, that my labors in the past have not been entirely in vain.

With fraternal greetings,
Very sincerely yours,
JOHN M. MAISCH.

Mr. Whelpley moved that the sincere thanks of the Association be tendered the druggists of Chicago and the members of the Illinois State Pharmaceutical Association for the entertainment and courtesies shown to the members of the American Pharmaceutical Association during the present meeting.

The motion was seconded and carried.

On motion of Mr. Zwick, the grateful thanks of the Association were tendered the retiring officers for their efforts to serve the Association during the past year.

MR. WHITNEY: As there are several nominations for membership in this Association, and no election can take place until the Council has passed on them, it becomes my duty, in the absence of Professor Good, to call the Council together and ask that the Association adjourn for five minntes, so that the Council can assemble and pass upon the nominations.

A recess of five minutes was taken, after which the Association was called to order, and the Council's report presented.

SIXTH SESSION OF THE COUNCIL—ART INSTITUTE, AUG. 19, 1893.

Present—Messrs. Alpers, Caspari, Dohme, Eliel, Ford, Fennel, Kraemer, Patch, Sheppard, Whitney and Wiley.

H. M. Whitney acted as temporary Chairman, and S. A. D. Sheppard as temporary Secretary.

The following officers and committees were nominated and duly elected:

Chairman, J. M. Good; Vice-Chairman, H. M. Whitney; Secretary, C. W. Kennedy.

Committee on Membership: Charles Caspari, Jr., Chairman, Wm. C. Alpers, Charles M. Ford, Leo Eliel, W. G. Smith, and the Permanent Secretary and Treasurer *ex-officio*. George W. Kennedy was elected Secretary of this Committee.

Committee on Finance: Chas. E. Dohme, Chairman, Gust. Ramsperger, W. Rogers.

Committee on Publication: C. T. P. Fennel, Chairman, C. L. Diehl, Adam Conrath, Henry Kraemer, and J. M. Maisch.

Committee on Centennial Fund: Edgar L. Patch, Chairman, Charles E. Dohme, J. M. Maisch.

Committee on Transportation: Thos. F. Main, Chairman, New York; Henry Sharp, Atlanta; S. A. D. Sheppard, Boston; A. E. Ebert, Chicago; W. J. M. Gordon, Cincinnati; Charles M. Ford, Denver; A. K. Finlay, New Orleans; M. W. Alexander, St. Louis, Mo; Wm. Searby, San Francisco.

Auditing Committee: Chas. E. Dohme, Chairman; Chas. Caspari, Jr., D. M. R. Culbreth.

On motion of C. T. P. Fennel, it was resolved that the names sent out by the Treas-

urer to the Permanent Secretary, just previous to the publication of the Proceedings, as in arrears, be dropped from the roll and published in the Proceedings.

It was moved by Leo Eliel, seconded by W. Rogers, that Alphonse Major, of New York, be expelled from the Association for conduct unbecoming a member. This matter had been referred to the Council with full power to act. (See page 66).

SEVENTH SESSION OF THE COUNCIL—CHICAGO, ILL., AUGUST 19.

Present.—Messrs. Caspari, Dohme, Eliel, Patch, Remington, Rogers, Sheppard, Whelpley and Whitney.

In the absence of the Chairman and the Secretary, H. M. Whitney presided, S. A. D. Sheppard acted as Secretary.

Thirteen applications for membership were presented by the Secretary, and the applicants recommended to the Association for membership.

The Council then adjourned.

On motion the report of the Council was received and adopted, and the Secretary instructed to cast a ballot for the election of the several applicants for membership.

The Secretary cast the ballot, and they were declared duly elected.

Two applications for membership not considered by the Council, having been presented after the recess, were submitted. A vote was taken, which resulted favorably, and the applicants were admitted to membership.

The Chair announced that it had been hitherto understood that the American delegates to the Seventh International Pharmaceutical Congrsss would be required to pay a fee of five dollars to be entitled to the privileges of the floor. This charge, however, has been withdrawn, and the American Pharmaceutical Association would be welcome to join in the Congress without cost.

THE PRESIDENT: Before adjourning, I desire to state that the services rendered to the Association by our Local Secretary, Mr. Biroth, have been of such a character that I think a special vote of thanks should be given to him. He has done work extending over a period of several months, and his labors have been of a kind that are very unusual for a Local Secretary to perform. I therefore move that the Association tender Mr. Biroth a hearty vote of thanks for his arduous services in the interest of this Association.

MR. WHITNEY: I believe that I can second this motion with a great deal of propriety, for I know that in our little eastern country the labors of the Local Secretary were somewhat arduous. In a place like this they must have been simply terrific, and I therefore second the motion with great pleasure.

The motion was carried unanimously.

The minutes of the third general session were read by the Secretary, Dr. H. M. Whelpley, and on motion approved.

On motion of Mr. Sheppard, the Association now adjourned to meet at Asheville, N. C., the first Monday in September, 1894.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—TUESDAY MORNING, AUGUST 15.

After the adjournment of the second session of the Association, the Section on Scientific Papers convened in Hall XXIV. of the Art Palace. The Section was called to order by Chairman Fennel at 3 P. M. Mr. Frank G. Ryan, of Philadelphia, acted as Secretary.

The proceedings were opened with the reading of the Chairman's Address, which was as follows:

Members of the American Pharmaceutical Association: The Scientific Section of the American Pharmaceutical Association voicing the history of the art of American Pharmacy, it may not come amiss at this time to touch upon the subject. United States, this important part of the globe, unknown to the civilized world until discovered by Columbus in 1492, has rapidly risen into consideration. Truly important by its vast extent and the immensity of its natural products and wealth, it has aroused action and enterprise, and formed one grand series of interesting and instructive scenes. The late Bishop Brooks once said, "No man to-day can practice any of the higher arts to the best effect, unless he knows the history of that art. Our life becomes extemporized and fragmentary unless each man, taking up his work in the world, not merely attaches his work to the work of those who went before him and begins where they left off, but also knows something of the way in which his art came to reach the point at which he finds it, and so is able to make the labor which he adds, a part of our consistent and intelligible progress."

The historical events leading up to the present status of pharmacy are of such magnitude and importance as to occupy rather too large a space of time to be considered at this meeting. In fact it would be quite unnecessary to go back to the origin or former state of pharmacy as now cultivated in civilized countries. It is generally understood, that, comparatively with the age of the world, the sciences which help to make the art of pharmacy of to-day, have but recently been submitted to such processes as bid fair to bring the art to the highest state of perfection. One science has helped another, and new ones have been brought to light that have greatly promoted the advancement of those before considered, understood and cultivated. We may cite the perfection of the naval system by the invention of the mariner's compass; the art of printing. These have given a proportional diffusion of light and improvement. But to perpetuate the

memory of events and to convey ideas to persons absent, invention first suggested the use of figures and images of things intended. This was doubtless the noblest of all inventions, as it has proven a most wonderful means of improving the human mind.

It has proved to be the father of all the liberal arts and sciences, and will continue to be the widening source of knowledge, happiness and admiration of every age. The invention of printing is entitled to an honor second to none but alphabetical writing. These inventions laid the foundation for the interchange of thought, and were the means for the cultivation and advancement of the human mind. In the midst of the gradually increasing light in the sciences of that day, a few men in various parts of Europe seem to have been able to tear off at once the palpable veil of darkness from men's mind, and to consume in a moment the mighty mass of stubble which ignorance and superstition had been heaping up for ages.

Regarding the practice of pharmacy of the United States as one entire subject, judging impartially and deciding with severity, we are compelled to say that it is on a footing not ouly favorable but highly flattering to the present and rising generation. The opportunities for education are within the reach of every person—this cannot with justice be said of any other nation. Those whose advantages are the worst, can scarcely be excepted; and in general the assertion applies with certainty and strength. This system of liberal education is the firmest pillar of our nation's liberty, prosperity and happiness. If we consider the lack of those liberal fortunes lavished in Europe to foster genius, and the want of access to proper sources of knowiedge in this infant country, we may point with pride to our many men of learning. We need look back but a short distance to find that we are the descendants of a race of people reared and instructed through the bravery, energy, economy and perseverance of their fathers, and by the industry, virtue, prudence and fortitude of their mothers.

Naturally such a race is not possessed of that artificial gloss which is derived from the smooth manners and the splendor of courts; but it is abundantly endowed with strength, firmness and the sturdy growth which inspires respect and confidence in every civilized community. The encouragement of genius by opulent men is a thing which is scarcely known in this country, nor is this strange when we consider the social and economic conditions of all classes.

We must confess that we have few men of leisure or men of very eminent learning, on account of these social and economic conditions. We need not dwell upon these conditions, for we all realize them, and know their influence upon the progress of American science. But, if compared with the nations of Europe as to numbers, sources, resources and advantages, we shall not be found deficient. Indeed, the inference from such a comparison will be found highly in our favor. We cannot boast of prodigies in the sciences, but we have men here whose attainments in the various branches of learning make American Pharmacy of to-day above mediocrity, and whose names will be transmitted with honor to posterity. We can point with pride to these men, and we are warranted in the assertion that no country or nation in so short a period of time has produced so many examples of talent and true merit. We all recognize this fact, and know that most of the first settlers of this country were men of ability and liberal culture, and a country has never been inhabited by a body of people who were more solicitous for the interests of learning and general education. Next to the establishment of the Gospel, their greatest object was to multiply schools. Their morality and piety, their spirit of enterprise, their habits of industry, their love of liberty, their attention to education, are unparalleled in history. These characteristics laid the foundation of the grandest institutions of this country, recognized and honored by the civilized world as seats of learning equal to the oldest and second to none. Yet we are apt to forget the very men, who struggled along with all the hardships, difficulties and privations incident to the establisment of American Pharmacy.

Every pharmacist should honor the names of Daniel B. Smith, of Philadelphia, Penna.; Thomas P. James, of Cambridge, Mass.; John Mudge, Merrick, of Boston, Mass.; Wilson H. Pile, of Philadelphia, Pa.; Charles T. Carney, of Boston, Mass.; Alfred B. Taylor, of Philadelphia, Pa.

Their work will live imperishably in our memories.

Nearly half a century has passed away since the wisdom and labors of William Procter, Jr., of Philadelphia, secured for American pharmacy an everlasting reputation, and he thereby immortalized himself in the hearts of American pharmacists.

Next to William Procter, no one did so much for the advancement of pharmacy, as Edward Parrish. Long may the influence of his labors live! The mantle of their fame has fallen upon worthy shoulders, and the name of that famed successor is hailed with delight in every nook and corner of the pharmaceutical world. In our illustrious President, Joseph P. Remington, we recognize all the signs that portend to American pharmacy's brightest day. Botany and Materia Medica have aided much in raising the standard of American pharmacy. The high status attained by these sciences is due almost solely to the unceasing labors of the men of our day and generation. History abounds in names, which from our distant standpoint appear as towers of strength, and which cast their shadows before us.

In American history no name shines with greater luster than that of John M. Maisch.

Far above the horizon appear two stars of the first magnitude that bid fair to retain the brightness imparted to American botany: Henry H. Rusby and Charles G. Lloyd.

The art of pharmacy is greatly indebted to those valuable contributions embraced in Plant Analysis by the lamented Henry B. Parsons. His literary contributions are recognized by the highest European authorities, and incorporated in all their standard works.

Many have greatly contributed to render every step that has been taken more accurate and certain, and to place every object of attention or inquiry more exactly in the rank and order it should occupy in the general circle of the arts and sciences. None deserve greater recognition in this field of action than Frederick B. Power and Theodore G. Wormley.

In the early days of American pharmacy, the number of drugs used were comparatively few and but little understood. Patient and careful work confined to few resulted in extraordinary progress and advancement in the knowledge of their properties and characteristics.

Every pharmacist in the land knows of the admirable work performed by Edward R. Squibb and C. Lewis Diehl.

The establishment of pharmaceutical societies for the diffusion of this knowledge through the free interchange of thought, inculcated a spirit of interest in the profession and a desire for investigation. Under this influence progress was remarkably rapid, nor was this advancement confined to a small portion of the United States, but all sections of this vast domain were prompt to respond to the demand for thorough and reliable information. Among those who distinguished themselves in the improvement and advancement of American Pharmacy, we may justly name Emil Scheffer, W. B. Chapman, Albert E. Ebert, Edward S. Wayne, Adolphus Fennel, John F. Judge, James W. Good and J. N. Hurty. We stand indebted to these men for some of the most thorough investigations, and in applying the results obtained to the practical application in the art of American Pharmacy. The progress made in practical Pharmacy was largely due to chemical investigations. Chemistry of the period before us may justly be considered a new science, having undergone very essentiul changes within the last fifty years. The discoveries in the line of experiment were exceedingly important and of great value to

the practice of Pharmacy. Among those who devoted their energies in this direction, we find the names of Ira Remsen, Albert B. Prescott, Edgar L. Patch, J. U. Lloyd, Henry Trimble, W. T. Wenzell, Wm. Simon, Sam'l P. Sadtler and R. G. Eccles.

In the march of progress the chemist of to-day finds that he no longer can pursue his researches single-handed. The continual changes of construction and destruction in the many processes of decomposition form the issue of to-day in the chemical sphere. Remarkable aid has been rendered in this field by Victor C. Vaughan and Frederick G. Novy.

In conclusion, let us for a moment look upon the results of the combined efforts of the men that have sacrificed time, labor and money in the advancement of American Pharmacy. Under the guidance of Dr. Charles Rice and the able assistance of Charles Mohr, P. W. Bedfor , C. S. Hallberg, Oscar Oldberg and a host of others, no nation ever issued a Pharmacopœia so complete, so thorough, so exact in all its details for the identification, purity and strength of drugs as the issue based upon the revision of 1890.

This intellectual pharmaceutical progress reflects the development and importance of Pharmacy in this country as a true American art and science. We may safely claim an unparalleled progress in all that constitutes a vigorous and prosperous science, equal, if not superior, to any other on the globe. We behold in this progress a tangible prophecy of a most brilliaut future for American Pharmacy.

On motion of Mr. Whelpley, the address was received and referred to the Committee on Publication.

Reports of committees being called for, the chair stated that at the preceding meeting of the Section in July, 1892, a committee of three, of which Mr. Hallberg was chairman, had been appointed to undertake the compilation of an ephemeral publication, containing brief descriptions of the new properties, uses and doses of such new remedies as appear from time to time, together with such pharmaceutical preparations as may have become sufficiently known to warrant it, such compilation to be published in convenient pamphlet form, at such intervals as may be deemed expedient, and to be distributed among medical men by pharmacists in their respective localities, the publication of such a work to be undertaken by the committee without expense to the Association.

The Section would like to know what the committee had done.

MR. HALLBERG: As to the work of that committee, I desire to say that I was unaware of the committee's appointment until I received the annual proceedings. I then corresponded with Mr. Snow, of Omaha, one of the members of the committee, and I also intended to communicate with Mr. Whelpley, of St. Louis, the other member, but the aid and opinion which I received from Mr. Snow were unsatisfactory, and, in fact, the entire procedure seemed to have been unwarranted, not to say misrepresented; and inasmuch as we had never been formally advised of our appointment on this committee, we eventually declined to do anything further in the matter.

THE CHAIRMAN: If my memory is correct, the recommendation came from Mr. Hallberg himself, at our meeting in the White Mountains. Mr. Hallberg made the recommendation, it was adopted, and the committee appointed in his presence.

MR. HALLBERG: The Chair, I think, will find by referring to the proceedings that the committee was not appointed. If it was appointed then, I was never aware of it. If the chairman will remember, some time about the first of the year I wrote to him with refer-

ence to the committee and its proposed work, and he replied that the matter was under consideration, would no doubt be attended to, and that the details would be received from Permanent Secretary Maisch. These details, however, were never received.

On motion of Mr. Ebert, this verbal report was adopted.

Nomination of officers for the ensuing year being in order, the members were invited to present names for the respective offices. Mr. Whelpley thereupon nominated Mr. L. E. Sayre, of Lawrence, Kan., for chairman, and Mr. Sayre, in turn, nominated Mr. C. M. Ford, of Denver, Col., for the position of associate member or secretary.

No further nomination being made, the election was deferred until the next session, the Secretary being instructed to post the names of the nominees in the hall, as required by the order of business.

Mr. L. E. Sayre read the following paper:

COMPOSITION OF TARAXACUM ROOT AT VARIOUS SEASONS OF THE YEAR.

BY PROF. L. E. SAYRE.

At the last meeting of this Association a paper on the juice of Taraxacum was presented, merely as a preliminary report of work done toward answering Queries 11 and 12. (See Proceedings, '92, p. 195.)

In pursuing this subject further it was soon found that it was almost impossible to arrive at any satisfactory conclusion regarding the variation in this root by expressing and analyzing the juice as suggested by Query 11. This procedure is attended with difficulties and errors; not least among the causes for these is found in the process of expression itself. It is next to impossible to exert upon two different collections exactly the same degree of pressure, and by pressure one cannot possibly obtain all of the juice from any specimen of fresh root. After digging, the juice coagulates rapidly in the interstices of the root; a few minutes' difference in the time consumed in cutting, crushing and preparing for the press, produces a marked difference in the yield of the juice.

These sources of error, so interfering with accurate work, made me think it best to determine the variation in the composition of the root by another process than that suggested by the query: this process is submitted with this paper.

In this investigation I have been surprised to find that, to a very remarkable extent, different roots collected in the same month may vary immensely in composition. In the course of this work it became necessary for me to use a root collected in June of the two years '92 and '93. The quantity collected of the former having been insufficient for the analysis, the root of '93 was necessary for the completion of the work. The root of the first year had been collected and dried for me in the sun, and the root of this year was collected, washed, chopped fine and dried in thin

layers in a hot-air oven at a temperature of 60° C. The former had been collected from low, and the latter from very high ground. The following table shows the difference in the composition of the two specimens:

Root collected in			1892.	1893.
Moisture	(in the dry root)	.....	9.79	9.48
Taraxacin	" "	.....	.612	.720
Inulin	" "	.....	9.34	4.83
Reducing Sugars	" "	.....	12.50	2.60
Levulin*	" "	.....	1.728	16.00

It has been stated by Polex, (1839) that taraxacin separates in warty crystals by boiling the milky juice with water and allowing the concentrated decoction to evaporate. I have become convinced in the course of this examination, that these so-called watery crystals do not contain the bitter principle, but are composed of inulin and inert matter. All attempts to obtain the bitter principle in a crystalline form, free from admixture of brownish-red extractive, have thus far been unsuccessful. The concentrated colorless solutions of this principle, when evaporated on a glass slide, show numerous crystals of a stellate form, but these are not easily separated from the extractive referred to. In the following illustration will be seen the microscopic appearance of those crystals as evaporated from an alcoholic solution on a watch glass.

The inulin does not appear in microscopic section of the fresh root. After the root has macerated in alcohol, however, for a short time, the spherules appear, well defined, in the parenchymatous tissue of the bark. Prolonged maceration in alcohol seems to decrease the size of the spherules. In the June root, macerated for about two weeks, the spherules appear well formed, and measure from 16 to 20 micro-millimeters. In the September and December roots, macerated a much longer time, the inulin appears in much smaller crystals, but showing the characteristic markings.

The following illustration represents the inulin in the sections named.

There is a vast difference in the amount of inert and coloring matter in roots of different months; that collected in the month of October is very rich in a soluble yellow coloring matter which is quite sensitive to the influence of alkalies and acids, turning red with the former. The root collected in April is remarkably free from coloring matter, and the solutions of the bitter principle from the roots collected in this month are the least prone to color up and change upon concentration. The inulin after precipitation was not purified in the course of this work, but was weighed as crude inulin. As these crude inulins contained various amounts of inert and coloring matters, the figures given below are therefore only approximate as to the amount of this principle.

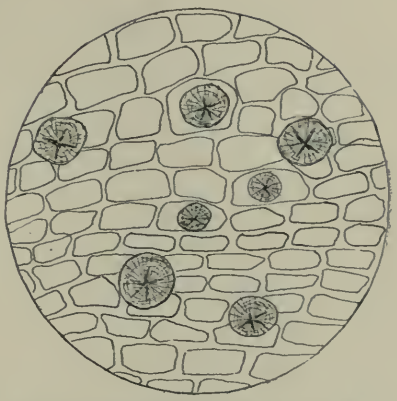
* For description of this amyloid principle, see Dragendorff's Plant Analysis, p. 212.

FIG. 1.

Taraxacin. Magnified about 400 Diameters.

As seen under the microscope the crystals are mixed, here and there, with amorphous masses of brownish-red extractive, which further treatment with a view of purification, seems difficult to remove.

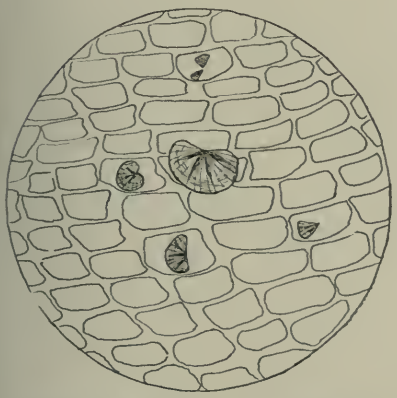
FIG. 2.



Transverse Section of June Root. Magnified about 400 Diameters.

Showing the well-formed spherules of Inulin. The root having been macerated about two weeks in alcohol before sectioning.

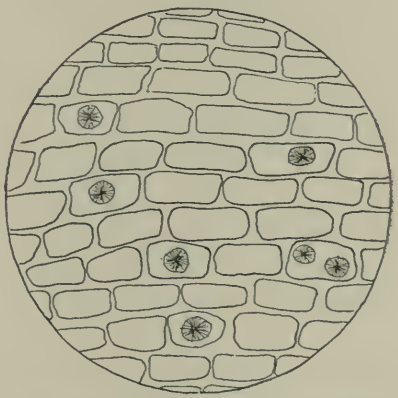
FIG. 3.



Transverse Section of September Root. Magnified about 400 Diameters.

The root having been macerated in alcohol about two months before sectioning. The spherules in this root appeared in some places contracted and imperfect.

FIG. 4.



Transverse Section of December Root. Magnified about 400 Diameters.

The root having stood in alcohol over four months. The Inulin granules here appear contracted.

The spherules of Inulin cannot be seen in sections of fresh root until they have been treated with strong alcohol. It requires more or less prolonged maceration in this fluid to develop and bring this principle into its characteristic form, and to show the peculiar markings of the spherules.

METHOD OF EXAMINATION.

I. Treatment of the Fresh Root for Moisture and Extractive.

(*a*) Moisture.—A known weight of the fresh root, chopped fine and spread in thin layer, was heated in a hot-air oven until it ceased to lose weight. The loss in weight was then computed.

(*b*) Extractive.—Another weighed portion was extracted with water, 9, and alcohol, 1 part. The dregs were then washed with warm water. The resulting mixed solutions were evaporated, and finally heated in a hot-air oven until the extract ceased to lose weight.

II. Treatment of Air-Dry Root for Taraxacin, Inulin, Reducing Sugars and Levulin.

(*a*) Taraxacin.—Ten grammes of the very finely powdered air-dry root was introduced into an extraction apparatus and percolated by continuous displacement with chloroform for eight hours. The chloroformic extractive after the evaporation of the chloroform was treated with distilled water and filtered. The precipitated resin was well washed upon the filter; the aqueous solution evaporated to dryness and the residue weighed and estimated as taraxacin.

(*b*) Reducing Sugars.—The residue (dregs) from (*a*) were treated with alcohol in a continuous extraction apparatus for eight hours; the alcoholic extractive treated with water and the solution quantitatively estimated for sugar by Fehling's solution.

(*c*) Inulin.—The residue from (*b*) was treated with warm water until exhausted; the aqueous solution was concentrated and to the resulting evaporate was added three volumes of alcohol. The crude inulin was collected on a filter, dried at 100° C., and weighed.

(*d*) Levulin.—The alcoholic filtrate from the inulin was evaporated to drive off the alcohol, and the dense residue dissolved in water. The solution, acidulated with HCl, was boiled for six hours, thus converting the levulin into reducing sugar. The sugar was estimated by Fehling's solution and calculated into levulin.

The result of this examination of dandelion root collected at different seasons may be tabulated as follows:

TABLE SHOWING THE DIFFERENCE IN COMPOSITION OF TARAXACUM ROOT COLLECTED AT DIFFERENT MONTHS OF THE YEAR.—CALCULATION OF PERCENTAGE COMPOSITION MADE ON BASIS OF FRESH ROOT.

MONTHS OF YEAR COLLECTED.	PER CENT. OF CONSTITUENTS.					
	Moisture.	Extractive.	Taraxacin.	Reducing Sugars.	Inulin.	Levulin.
March.	75.8	16.10	.130	.588	1.587	4.92
April	83.6	8.675(?)	.0551	1.049	1.046	1.047
May	77.06	13.29	.182	.684	.687	1.374
June	82.2	12.16	.1459	.5268	.9787	3.242
July.	80.14	14.92	.0864	.3116	.9056	3.464
August	79.215	12.876	.07481	.842	4.026	2.077
September	79.63	13.27(?)	.2399(?)	.5217	2.374	.8954
October.	78.65	12.47	.123	1.977	1.33(?)	.832
November.....	77.83	12.52	.1013	1.483	2.313	.4246
December.....	71.15	15.89	.0847	.833	2.87	1.986
February	72.32	.....	.174	1.055	1.355	.335(?)

In most cases three determinations were taken. Errors were possible, of course, but close attention was given to every detail of the work; as close attention, at least, as was possible under the pressure of duties of the laboratory and lecture room.

Although the air-dry root was used for the extraction of the various principles, the amounts of these contained in the table correspond to the amounts present in the fresh root, allowance being made for the difference in the moisture of the air-dry and the fresh root.

It may be objected that the proportion of the constituents of the dried root does not fairly represent that of the fresh. This point I shall endeavor to settle in a future investigation. For this purpose I am providing myself with a small vacuum apparatus in which the juice and aqueous percolates may be concentrated without, possibly, the least change. There is no question that the slow drying of the substance modifies the constituents. To what extent this is the case will be interesting to know. During the next year I hope to be able to go over the same ground, pay more attention to the location from which the root is collected, endeavor to select the root from the same condition of soil, etc., and shall endeavor to decipher the cause of the apparent irregular and eccentric diversity of composition.

MR. LLOYD: In regard to the method of obtaining the inulin, described in the paper, I would ask Mr. Sayre, simply for information, whether he tested that substance to ascertain whether it contained inorganic salts?

MR. SAYRE: I did not. I may add, however, that I had an interesting experience with the inulin. I sent East for a sample of pure inulin, wishing to compare it with the inulin I had extracted. Upon examination of this inulin I found it to be simply a resinoid of inula helenium.

MR. LLOYD: It is well known that most plants contain large quantities of inorganic salts, usually calcium salts and potassium nitrate to some extent, and the method given here under "C.," in my opinion, would precipitate most of those compounds, and it would therefore be well to estimate the inorganic substances.

MR. SAYRE: I burned some of the inulin on platinum foil, and it gave a slight residue. There is, of course, a great deal of organic matter present, and some inorganic, but the amount of inorganic matter I did not estimate.

THE CHAIRMAN: There can be no question that the inorganic salts are precipitated in the menstruum used.

MR. LLOYD: There is another interesting point in this paper, namely, the comparisons that are made. The first root was sun-dried, while the second was dried at a temperature of 60°, on the supposition, I presume, that the sun-dried did not reach above 60° (Celsius).

MR. SAYRE: No; I had no supposition about this. It was merely by accident, as you will notice, that I compared the two. The 1892 root was collected for me by a student, who dried it according to my directions, but in 1893 I had not quite enough of the 1892 root; I dried it rapidly, as I have dried others, at 60°. Upon analysis of the 1893 root I found, to my surprise, that it was different in constitution, and the question then arose how much did it differ. It was therefore by a mere accident that I happened to compare the two, for I had no purpose in drying at 60°.

THE CHAIRMAN: Any inherent or adherent water would not be completely lost at a temperature of 60°. Why not take a temperature of, say, 100° (Celsius)?

MR. SAYRE: Because of the danger of decomposition of organic principles at this temperature.

MR. LLOYD: It is the work of a lifetime to examine any one plant, and do it accurately. I think that Mr. Sayre will find that the drying of the root increases the bitterness, and that the bitter principle is active to a certain extent.

MR. SAYRE: I have thought, on the contrary, that the bitterness decreased upon drying. I cannot state this positively, however.

There is one thing I would like to mention while I think of it. I wish that some one in the East—in Pennsylvania or New York—would kindly volunteer to send me samples of taraxacum every month. Professor Williston, of our University, assures me that the Western taraxacum is much more bitter than that of the East. While I am engaged in this work, I might as well take up that subject. If any one residing in the East will send me every month during the year some taraxacum root collected, say, about the 10th of each month, I shall greatly appreciate the service, and shall thus be enabled to compare the Eastern with the Western taraxacum.

THE CHAIRMAN: I am glad that this question of temperature has been brought up, because if a temperature of almost 100° C. is employed, I am satisfied that changes take place. Whether heat reduces or increases the activity, though, I do not know. When Mr. Sayre mentioned the temperature of 60° Celsius I felt sure that he had experienced the fact that a decrease would take place at a temperature of 100° C., and this is a very important point, which should be noted.

DR. ECCLES: Is there not a change at any temperature?

THE CHAIRMAN: That is an open question.

DR. ECCLES: And the higher the temperature the greater the change.

THE CHAIRMAN: I should not be surprised. I am afraid, however, that if we were to acknowledge that point positively, we might upset our theories concerning the alkaloids or active principles of drugs.

DR. ECCLES: I don't see why we should be afraid to acknowledge anything that is a fact.

THE CHAIRMAN: It produces uncertainty. If the factor of heat plays such an important part that, say, at a temperature of one, two or even twenty-five degrees, the constitutional structure of the compound is changed, then we must admit that chemical changes are largely influenced by heat. Now, the temperature may under certain conditions have such an effect, but whether it will do it at all times is uncertain. There may be a limit to it. Therefore we cannot make a positive assertion. It is an open question.

DR. ECCLES: The way to make chemistry a definite science is to discover the fact.

THE CHAIRMAN: But the surrounding conditions and influences may vary, and may have some bearing on the subject.

Mr. Patch read the following paper:

LABORATORY NOTES.

BY E. L. PATCH.

1. *Variation of Menstrua in Fluid Extracts.*

We have had so many queries arise concerning physical variations and incompatibilities of fluid extracts from the same drug, that we have been led to secure samples and estimate percentage, weight, strength of alcohol, used as menstrua, at the same time observing their physical variations.

In an exhaustive paper presented to the American Medical Association these data are preserved, and we here contrast a few products made from the same drug, by the same operation, using different menstrua.

The experiments were in the main as follows:

1st. A moderate quantity of fluid extract made from each drug by the ordinary process of repercolation, using 91 per cent. by weight alcohol.

2d. 100 G. of drug, properly moistened, macerated and percolated with a weaker alcohol, the first 75 c. c. reserved as "A" percolate and the next 100 c. c. as "B" percolate.

These were also examined as to odor, color, assay, etc. The following table gives the results, but actual comparison of the samples submitted is necessary to the full understanding of its value. A complete comparison would involve therapeutic action, but this we have been unable to obtain:

Name of Drug.	Different samples o Drug gave Fl. Ext's with 91 per cent. alcohol ranging in extractive.	Alcohol used in Fl. Ext.	Per Cent. of Extractive.	Color, Odor, Taste, Etc.	Alcohol used in "A" and "B" Percolates.	Per Cent. of Extractive "A."	Per Cent. of Extractive "B."	Activity of Drug.
Asarum	5 per cent. to 11 per cent.	91 per cent.	11.8	Superior to "A"—more permanent.	50 per cent.	12.7	8.	Vol. Oil and Resin.
Aspidium	15 per cent. to 20 per cent.	"	20	Compared favorably for "A."	64 per cent.	28.	8.3	Filicic Acid, Vol. Oil, Resin, Tannin.
* Belladonna Root	6 per cent. to 10 per cent.	"	6.7 Alkaloid .42	Favorable to "A."	80 per cent.	19. Alkaloid .48.	3.	Alkaloid, Atropine.
Bryony	.....	"	8.	Do.	64 per cent.	14.2	5.	Bitter glucoside, Bryonin.
Canella	16 to 20 per cent.	"	20	More aromat., more perman't than "A."	70 per cent.	29.4	5.2	Vol. Oil and Resin.
Coriander	5 to 7 per cent.	"	7	Do.	64 per cent.	8.6	3.	Vol. Oil.
Fennel	13 to 16 per cent.	"	14	Do.	68 per cent.	9.7	4.1	Do.
Guaiac Wood	15 to 24 per cent.	"	19	Superior to "A."	68 per cent.	6.7	2.3	Resin.
Helonias Stripped	.....	"	23	.....	.....	.....	.....	Neutral Bitter Principle.
Helonias with Fibre	.....	"	12.5	Favorable to "A."	68 per cent.	14.5	3.1	Chamælirin.
† Larkspur Seed	35 to 40 per cent. including fixed oil.	"	38 with Oil.	Separates in two layers.				
	6 to 8 per cent. after removing oil.		Alkaloid of mixture .48	68 per cent. better than 91 per cent.	68 per cent.	10.2 Alkaloid .48	3.4	Alkaloids. Delphinine, etc.
Pellitory Root	.....	"	6.2	?	64 per cent.	10.7	2.6	Acrid resin.
Sumbul	.....	"	30.	Favorable to "A."	68 per cent.	32.2	4.	Vol. Oil, Resin, Valerianic Acid.
Thyme	.....	"	10.	Stronger than "A."	64 per cent.	14.2	5.8	Vol. Oil, etc.
Wild Yam	10 to 15 per cent.	"	15	No advant. for "A."	50 per cent.	17.	3.5	Resin (?).
☞Wormseed Levant.	.....	"	23	Do.	60 per cent.	33.	16.	Santonine, Vol. Oil.
Triticum	Boiling water, etc., U. S. P.	18 per cent.	37 to 43 per cent.					
					18 p. c. reperc.	34.8	7.	
	By perc. and evap. using 18 p. c. alco.		42 per cent.					

* *Belladonna root* varies greatly in amount of coloring matter, and we may purchase light or dark root, but the color is further modified by alcoholic strength of menstruum, as observed by the comparison of the samples made with 91 per cent., 80 per cent. and 3 per cent. by weight alcohol. The sam-

Powdered Oleate of Zinc.—The statement is made by high authority that all powdered oleate of zinc is a mixture of oleate and oxide, it being impossible to produce a powdered product without the addition of oxide.

The statement is an error. Powdered oleate of zinc is made free from oxide, but it consists of a mixture of oleate and palmitate.

It is made by reacting between castile soap, oleo-palmitate of sodium, and sulphate of zinc.

Process.—Dissolve 200 G. of white castile soap in 2000 G. of distilled water (common water yellows the product) and neutralize the *excess* of alkali by very careful addition of 1 per cent. sulphuric acid (any excess of acid frees the fat acids and yields a fatty non-drying product).

To the soap solution add with constant stirring a filtered solution of 70 G. of zinc sulphate in 500 G. of distilled water. Wash the precipitate first with warm distilled water (not hot), then with cold distilled water to remove all excess of zinc sulphate and sodium sulphate, transfer to drying frames, spreading one-fourth inch thick between double cloths, and dry at 110° F. When *thoroughly* dry pass through a No. 80 sieve.

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ple of root in question assayed .50 per cent. alkaloid, by gravimetric assay, using Prollius' with half strength of ammonia.

The fluid extract by repercolation with 91 per cent. by weight alcohol, yielded 6.7 per cent. extractive and 4.2 per cent. alkaloid. The percolate "a," with 80 per cent. by weight alcohol, assayed .48 per cent. alkaloid. Evaporating "b," and adding extractive to "a," with enough menstruum to make 100 c.c., the product assayed .56 alkaloid. Other samples using 91 per cent. by weight alcohol, assayed .4 per cent., .42 per cent. .44 per cent., .46 per cent., and .38 per cent. alkaloid. A sample made with .70 per cent. alcohol assayed .6 per cent. alkaloid.

† *Larkspur Seed* contains 29 to 35 per cent. of a fixed oil that seems mechanically carried through with a strong alcoholic menstruum. At all events, we have noticed the separation of such fluid extracts into two layers, that on separation gave 30 per cent. fixed oil and 70 per cent. alcoholic liquid. Assay of the oily portion showed a mere trace of alkaloid, while the alcoholic portion assayed .64 per cent. alkaloid, which was more than yielded by the original seed.

The drug used in the experiments of the table assayed .54 per cent. alkaloid. Exhausting the seed with benzine, drying residue and extracting with 91 per cent. by weight alcohol, the product assayed 6.5 per cent. extractive and .48 per cent. alkaloid—a fluid extract from the same drug made with 68 per cent. by weight alcohol, yielding 11 per cent. extractive and .48 alkaloid.

Assay. Shake 10 G. of the seed in fine powder for six hours, with 100 c.c. modified Prollius' liquid; decant 50 c.c. into separator, wash out alkaloid with three portions of 10 c.c., 5 c.c. and 5 c.c. of 10 per cent. sulphuric acid, neutralize acid washings with ammonia in slight excess, wash out alkaloid with 3 portions of ether-chloroform of 15 c.c., 10 c.c. and 10 c.c. each, evaporate solvent, dry alkaloid at 60° C., and weigh.

Assay of Fluid Extract. Shake 5 c.c. with 20 c.c. of water and 5 c.c. 10 per cent. sulphuric acid, wash out the fixed oil with three portions of ether-chloroform, make aqueous acid solution slightly alkaline with ammonia, wash out alkaloid, and dry as before. If all fixed oil is not removed, it will be extracted with the second washing and be weighed as alkaloid.

If spread in thick layers it dries slowly, and becomes rancid. If dried at a higher temperature it coheres and yellows in color.

Pure Oleate of Zinc.—This may be made best by reaction between pure oleate of sodium and solution of zinc sulphate.

Solution of Sodium Oleate is made as follows: In a suitable vessel heat together 526 G. of 5 per cent. solution of sodium hydroxide and 184 G. of oleic acid. When perfectly saponified add gradually 1000 G. of boiling distilled water, strain, add distilled water to 2000 G. This gives a 10 per cent. solution of sodium oleate, as seen by the following reactions and equations:

$$NaOH\ (40) + HC_{18}H_{33}O_2\ (282) = NaC_{18}H_{33}O_2\ (304) + H_2O.$$

Two thousand G. of 10 per cent. solution would contain 200 G. of sodium oleate. Then—304 G. sodium oleate : 200 G. :: 282 G. oleic acid : 184.8; and —304 G. sodium oleate : 200 G. :: 40 G. NaOH : 26.3 NaOH, or 526 G. of 5 per cent. solution.

Pure Precipitated Zinc Oleate.—To 24 G. of zinc sulphate dissolved in 500 G. of distiled water add with brisk stirring 500 G. of 10 per cent. solution of sodium oleate. Wash the precipitate with water, work out all the water possible, fuse in a shallow vessel, stir until cold.

This is a soft solid, saturated pure oleate of zinc representing 10.35 per cent. metallic zinc and 12.9 per cent. oxide, as seen by the following reactions and equations:

$$ZnSO_4.7H_2O\ (286.9) + 2NaC_{18}H_{33}O_2\ (608) = Zn\ (C_{18}H_{33}O_2)_2\ (626.9) + Na_2SO_4 + 7H_2O.$$

626.9 Zn Ol_2 : 100 per cent. :: 64.9 zinc : 10.35 per cent.
626.9 " " " :: 80.9 " : 12.9 "

A slight excess of metallic salt is used because an excess of soap is more objectionable and is more difficult to remove.

Digitalis Assay.—At the New Orleans meeting we commented favorably upon the results obtained in assay of digitalis by Palm's method.

It was stated that the digitalin was obtained in well defined, slightly colored crystals. Mr. Drake recently observed upon fusing these crystals an odor of sulphurous anhydride and subsequent quantitative determination of the sulphur present, employing Fresenius' method of heating with pure solution of KOH, adding distilled water, oxidizing with chlorine, acidifying with pure HCl, heating to expel Cl, filtering and precipitating with $BaCl_2$, gave a notable amount of sulphur present and proved the method as conducted to be of no value.

We at once set about an examination of other methods and the trial of new ones, but do not feel justified in reporting results at present.

Amylic Alcohol.—The call having arisen for a rectified amylic alcohol for the manufacture of amyl nitrite by the process of employing it with sodium nitrite aud sulphuric acid, various lots were obtained for trial with the following results:

No. of Lot.	Price paid.	Sp.gr. at 15° C.	Commenced to boil.	200 c.c. gave below 110° C.	Between 110 and 125° C.	125 to 132° C.	Residue.	°C 100 to 120.	° C. 120 to 128.
1.....	.75 gallon	0.8324	85° C.	45		65	12	20	55
2.....	.60 "	0.8270	85° C.	40	45	107	9		
3.....	.40 "	0.8260	88 C.	40	45	105	10		
4 Corn....	.55 "	0.8330	85° C.	41	37	112	10		
5 Potato..	.50 "	0.8270	86° C.	40	35	111	12		

The fractions boiling at 125 to 132° C., mixed together, had a boiling point increasing from 124 to 132° C., and a sp. gr. at 15°C. of 0.8150.

Prescott describes fusel oil as a variable body of amyl alcohols with small proportions of butyl and propyl alcohols, having boiling points of 131–4° to 128° C. for amyl alcohols, 116°, 108.4° and 84° for butyl alcohols, and 97.4° to 82.8° for the propyl alcohols. Sp. gr. from 0.812 to 0.788.

Fowne's "Ordinary amyl alcohol," or isobutyl carbinol, boils at 128° to 132° C., and has a sp. gr. of 0.825 at 0° C. Potato fusel oil consists almost wholly of amyl alcohol, mixed with ethyl alcohol.

Thorpe gives boiling point as 131.6° C., and sp. gr. as 0.8113 at 18.7° C. He gives for its purification the process of shaking with hot milk of lime, decanting, drying over calcium chloride, and distilling at 132° C. Evidently the fraction obtained from common fusel oil between the boiling points at 125° to 132° C., corresponds to the requirements of "rectified amyl alcohol." It is 50 to 56 per cent. of the volume of the crude.

VARIATION IN ASSAYS.

Considerable variation may occur in assays made upon samples selected from whole drugs and powders from quantities of the same drug. To illustrate, we give the following report upon five bales of cinchona purchased to contain over 7 per cent. total alkaloids and 3 per cent. quinine.

Bale 1—Whole bark, air dry, No. 20 powder, No. 60 powder, No. 60, dried at 100° C.

	Total.	Quinine.	Total.	Quinine.	Total.	Quinine.	Total.	Quinine.
No. 1	7.6	2.2	.....	.....	8.1	4	6	4.4
No. 2*	6.7	2.6	.....	.....	5.5	3.3	9	3.67
No. 3†	9.04	4.12	8.6	4.2	7.42	3.88	8.2	4.2
No. 4	7	3.1	.....	.....	6.8	3	7.4	4.3
No. 5‡	2.2							

* Sample 2 was submitted to a party for report by the new U. S. P. process, and it was reported to be 5.3 per cent. total and 2.9 quinine.

† From some No. 60 powder made from No. 3, some No. 20 was sifted and submitted to assay. The result indicated a higher percentage than the mixture of powders it was taken from.

‡ No. 5 was rejected as valueless after three assays failing to bring the percentage of total alkaloids above 2.2 per cent.

As this in air dry No. 60 powder gave 5.5 per cent. total and 3.3 quinine and lost 8.58 per cent. moisture, drying at 100° C., the dried bark should represent 6 per cent. total and 3.6 per cent. quinine. This report would indicate a loss of 0.7 per cent. total and 0.7 quinine.

This led us to consider the process, and after making allowance for inexperience of the operator with the process, we are inclined to believe that error was made in using the specified quantity of decinormal sulphuric acid in washing the alkaloid from the mixture of coloring matter, fat, etc., and that it would have been better to have used enough to free it from bitterness, and subsequently employ an equivalent of soda solution.

To demonstrate the solvent power of the official menstruum used in fluid extract of cinchona, a bark assaying 11.5 per cent. total alkaloid was percolated and the percolate reserved in three portions of 100 c.c. each. No. 1 yielded 4.61 per cent., No. 2, 3.73 per cent., No. 3, 3 per cent.

Aconite Root.—Two samples of whole from the same lot assayed .40 per cent. and .78 per cent. respectively, while the mixed No. 60 powder from the entire lot assayed .72 per cent., and the fluid extract made from it assayed .68 per cent. Other lots of root assayed .61 per cent., .66 per cent., .62 per cent. and .70 per cent. Other lots of fluid extract assayed .52 per cent., .48 per cent., .59 per cent., .66 per cent. Lots of powdered leaf assayed .27 per cent., .32 per cent., .26 per cent.

THE CHAIRMAN: I am very sorry that Mr. Patch retained his paper until the last moment, for had I received it earlier, I should certainly have exceeded my authority by marking it for competition. This paper shows the kind of work that has placed American pharmacy where it is to-day, and gained for it the recognition it has received from other countries.

MR. EBERT: This paper, the Chairman says, illustrates the progress of American pharmacy. I would like to ask Mr. Patch whether he knows how many officinal fluid extracts there are in the new Pharmacopœia.

MR. PATCH: There are about seventy-two, I believe.

MR. EBERT: And the average manufacturing pharmacist has about two or three hundred. I simply want to get at a practical point in this paper.

DR. ECCLES: I have 416 in my laboratory.

MR. EBERT: I desire to say that we have had a most valuable exposé of American pharmacy presented, one which shows why it is that the number of so-called chemical manufacturers has increased from two or three in 1850 to about six hundred in 1893, and why so few pharmacists are making their own fluid extracts.

I will say, further, that there are probably not two manufacturers in this country making their fluid extracts with the menstrua of the Pharmacopœia, and yet I fear the thirty or forty thousand druggists of the United States are buying their fluid extracts from the various manufacturers regardless of the fact that the medical profession expects accuracy on the part of the pharmacist in dispensing the fluid extracts of the Pharmacopœia when specified in prescriptions. I lay particular stress on this, because the new Pharmacopœia has just been issued. We begged the framers of that work to give us 50 per cent. fluid preparations that we, as pharmacists, could make, and thus enable us to be

more independent of the six hundred manufacturers in this country. I know that there are very conscientious pharmacists who listen to the manufacturer's representative when he says: "I can furnish you with fluid extracts at a less cost than you can make them, for if you are now getting 25 per cent. off, we will give you 50 per cent. off." The temptation is too great, and they succumb to it. In spite of the fact that so much depends on the percentage of water and alcohol used in extracting the various drugs, the majority of us, claiming to be accurate pharmacists and followers of the precepts of the Pharmacopœia, buy from the six hundred manufacturers the greater part of these preparations that we dispense on the prescriptions of medical practitioners. For this reason, I inquire, where do we stand to-day, and to what extent is pharmacy progressing?

MR. VERNOR: Why do you buy your fluid extracts?

MR. EBERT: Because I do not manufacture them.

MR. VERNOR: Why do you not manufacture them?

MR. EBERT: I am one of the thirty or forty thousand druggists who buy fluid extracts. There are only a few select people who make these preparations. I believe there is not a man in this Association who can honestly say, "I make all my fluid extracts." I have never met such a one, and I make these statements because I want to bring the subject again to the attention of the compilers of our Pharmacopœia.

THE CHAIRMAN: We all recognize the conditions that exist, but we cannot overthrow them at the present time. We make every effort to do so, however, and Mr. Patch has shown, in a very lucid manner, how we can do it.

MR. EBERT: I am very glad to hear it. You will, however, remember that at the Old Point Comfort meeting the compilers of the Pharmacopœia were asked to discard this class of fluid preparations that has been so detrimental to pharmacy in this country; and if, instead of increasing this class of preparations, the compilers of the Pharmacopœia had reduced the number, and had substituted 50 per cent. tinctures, which every pharmacist could make, I guarantee that we would not be in the hands of these manufacturers, who are taking the life out of the drug business of the United States.

DR. ECCLES: I should scarcely venture to make so broad a statement as Mr. Ebert has made, namely that there are not two manufacturers in the United States who follow the Pharmacopœia. There must be more than two, and I know there is one; but I will not mention any name so that advertising can be obtained. While acting as chemist for the United States Government in examining fluid extracts which were sent in as supplies, in competition, I had to examine a quantity that were made by various manufacturers. I found that the extracts they undertook to supply the Government with, scarcely ever came up to the standard of the Pharmacopœia, while a very large proportion of them had no alcohol in them at all. These were, of course, rejected, and the houses then had the cool audacity to inform me that no manufacturer adhered to the pharmacopœial standard, and that goods of this quality had to be specially made for the Government.

The question was asked, just now, why is it that the pharmacist has to buy his manufactured fluid extracts? It can he very readily answered: The dear public is to blame, because it wants cheap goods.

MR. REMINGTON: I desire to say a few words on this subject, because for a number of years I have had something to do with the making of fluid extracts. Our friend Ebert has made certain statements which, I think, are scarcely in accordance with his own cool, better judgment. In my opinion, the manufacture of fluid extracts has greatly improved of late years, and I want to point to the signs of the times in still another di-

rection. We have manufacturers who advertise, and who send representatives to the retail druggists throughout the country, claiming that they are adhering strictly to the United States Pharmacopœia. Never in the history of American Pharmacy has there been such an effort on the part of manufacturers to conform to the Pharmacopœia as at the present time. I do not want to mention the name of any manufacturer, but will say that you can go into any wholesale house in Chicago, and can find goods which will assay according to the United States Pharmacopœia standard. Now, gentlemen, when the manufacturers of this country are turning to the Pharmacopœia, and are advertising their preparations to be according to the Pharmacopœia, and not only that, but have enabled the retail druggists to obtain drugs prepared according to the Pharmacopœia in every particular, even to the fineness of powder, I ask whether the Pharmacopœia has not done everything for you that is possible? If Mr. Ebert, while carrying on his business in Chicago, admits that he does not follow the Pharmacopœia, and does not make his fluid extracts, then I say that it is cause for regret that he cannot be compelled to make his fluid extracts by the Pharmacopœia, and use the Pharmacopœial processes. You will notice that he gives no reason for not using it; yet I know Mr. Ebert's ability too well, to suppose that he cannot make fluid extracts by the Pharmacopœia. He has not attacked the processes in a single particular, and no one can justly, so far as their manipulation is concerned; for there isn't a man who understands the first principles of percolation who cannot make a fluid extract by the Pharmacopœial processes. They are simple enough, and there is no excuse for the pharmacist not making fluid extracts.

There is also another point to which I desire to call attention. I contend that it is profitable for the retail druggist to make his fluid extracts by the Pharmacopœia, and the claim made by some of the manufacturers of this country that the retail druggist cannot get such good drugs in the market as they can with their immense facilities (having their agents all over the world engaged in securing the best goods, etc.), is without practical force; for if the quality of the fluid extracts made by pharmacists throughout the country should be compared with that of the fluid extracts made by the manufacturers throughout the country, the results would show the general superiority of those made by the pharmacist.

Mr. Caspari; I should like to say a few words on this subject, and specially in reference to one point. In listening to Mr. Patch's able paper, it struck me as peculiar that of the line of fluid extracts mentioned but two are of the Pharmacopœia. All these extracts, aromatics and similar preparations which are not official, of course, are bought by the apothecary from the manufacturer, and they are made with whatever menstrua the manufacturer chooses to use. The apothecary has no right to complain; there is no standard for menstrua, and he must take all the water that the manufacturer chooses to put in his fluid extracts. I certainly think there would be more value in this comparison if its scope had been somewhat enlarged, instead of simply having the belladonna and triticum, the only two official extracts that I think I recognize.

This also applies to Mr. Ebert's statement in regard to the manufacturers placing such a large number of fluid extracts on the market, and the apothecaries buying them. Nothing was said about buying official fluid extracts made with inferior alcoholic strength, and we must assume that the market to-day is pretty well supplied with fluid extracts of official quality so far as menstrua are concerned. There may be a little variation in our manipulation, and it is necessary in large operations. The man who works upon a large quantity cannot do so well as the man who works on a small quantity. It is out of the question. There is a great deal of valuable information in this paper about menstrua, but it is not entirely in the line of official fluid extracts.

If I had a call for fluid extract of snake-root, for instance, I might look up the authorities to see what menstruum to employ in extracting the drug, and would act accordingly. If the manufacturer offers me one, I take it upon the reputation of the house. It is not

a question of whether it is alcohol, glycerin, or glycerin and water, so that argument, I think, will fall.

In connection with oleates, I would ask this question: whether the processes suggested by Mr. Patch have ever been tried on large quantities? The proportion he gives, I believe, was 200 grammes of soap and 70 grammes of zinc sulphate.

MR. PATCH: In our retail experience we had a large call for powdered oleate of zinc, and at that time the price in the market was about $4 a pound. As the demand increased we made it ourselves in this way, making it in quantities of from five to fifteen pounds, and eventually getting the price down to about 70 cents a pound. In some localities there may still be a demand for it; in other localities it has died out. We would make it in fifteen pound lots, which was the largest we had occasion to work, and ordinarily there is no trouble whatever in the process.

While I am speaking on this subject, I may perhaps be permitted to answer the question as to why the fluid extracts presented were selected for this paper. In the paper read before the American Medical Association, to which I referred, you will find the official fluid extracts compared. Why these were selected is because they are not in the Pharmacopœia, because there was no standard, and in order that the members of this Association might see what the proper standard should be if judiciously selected. If it is already in the Pharmacopœial processes you have no chance of election, but must use the Pharmacopœial menstrua. But here are compounds constantly called for. They are presented for you to exercise your own judgment upon, and when you make fluid extracts, if you choose to use the menstruum that gives the best product, irrespective of the cost, you can do so. In our retail experience we followed this rule, that if in the course of the year we had a call for five pounds of a certain fluid extract, we always made it. If it was a costly one, on which there was a fancy price, dependent upon its being an article little known, and we used two pounds, we also manufactured it. We preferred, in our retail experience, to make fluid extracts that are in ordinary demand. The pharmacist has two choices open to him in the Pharmacopœia, that of percolation and evaporation, or that of repercolation; and if he care to carry reserves in stock, he can do away with any of the costly apparatus, stills not being required. There is no reason why the retail pharmacist should not find it profitable to make this class of products. Of course, he cannot compete with the manufacturer who works with 500 pound and ton lots, but if thorough in his work he can be satisfied with what he has, and not only take pleasure in having the product made under his own observation, but also, as we have had suggested here, gain an advantage in economizing.

MR. CASPARI: Mr. Patch has evidently misunderstood my criticism. I did not intend to criticise the paper, but to suggest that its benefit would have been greater had the comparison been made with official fluid extracts prepared with official menstruum or weaker menstruum, as we have no standard for such fluid extracts except the arbitrary standard of the manufacturer.

MR. PATCH: We selected the highest and lowest menstruum that we found to be used, after examining a long line of fluid extracts made by different manufacturers, and you can see the relative value of these grades of menstrua.

THE CHAIRMAN: I think Mr. Patch is right in the point he has made. It is supposed that every fluid extract of the present Pharmacopœia has been tested—that is, the crude drug—as to the exhaustive qualities of the different menstrua that are used. This is a class of preparations, of course, for which there is no standard, and for that reason he has selected it.

MR. CASPARI: But in the absence of a standard laid down for a line of fluid extracts,

which a manufacturer offers the retailer—and I am not speaking for or against the manufacturer—the apothecary takes the article offered, and he will not know, until he mixes it with an aqueous liquid or a mucilaginous solution, whether it has been made with strong alcohol or not.

Regarding the oleate, I note Mr. Patch states that he made fifteen pounds by this formula. I have attempted on at least a dozen occasions to make lots of ten pounds of zinc oleate by a formula almost identical, published in the American Journal of Pharmacy some years ago, in which there was suggested a preparation of true sodium oleate, by neutralizing oleic acid by hydroxide of sodium and then mixing with zinc sulphate and precipitating at 110° F.

MR. PATCH: I think I stated in the paper that you cannot make a satisfactory powdered oleate of zinc from pure sodium oleate that will give you a strength representing over 10 per cent. of metallic zinc or over 12 per cent. of zinc oxide. This forms a soft ointment, and does not give a powdered product. You must use the oleo-palmitate obtained from castile soap to get this.

MR. CASPARI: The pure oleate can be made in a fine powder if you do not go beyond eight ounces. I have made it that way, in large lots, but have had to divide it and make eight ounces at a time.

MR. PATCH: It might be made by using ice water. You can precipitate saturated oleate, but the least increase in temperature influences it, causing it to cohere, turn yellow and become rancid. You have no trouble in making the oleo-palmitate perfectly dry, however, and if carefully made it will last a long time. We have made it by this formula for something like ten years, and, as I say, years ago there was a very large demand for it, and we have made it in fifteen-pound lots for the purposes for which some physicians employed it; but the demand has ceased, and now we do not make it at all.

MR. CASPARI: I must say that in making it by all the methods, I have never been able, with fine powder, to get more than eight-ounce lots. I have worked at increased and decreased temperatures, and my opinion is that a temperature above 112° F. will give better results and produce an impalpable oleate superior to any other. I have made an oleo-palmitate by using a cooler water with the latter, the precipitation being more divided; but in making it from the sodium oleate, which was made from an oleic acid direct, and then using 110° F., I succeeded in getting an impalpable powder of pure oleate, but have not done any work upon large quantities, because they require great dilution.

DR. ECCLES: I would ask Mr. Caspari what is meant by certain authorities who state that the use of the fine powder of ipecac recommended by the Pharmacopœia would ruin he manufacturer?

MR. CASPARI: He could not percolate. It is a well-known fact that manufacturers could not take powdered ipecac and work 500 pounds by percolation. If you ask them, they will tell you so, and that there is not a drug in the Pharmacopœia which they can handle in 500 or 1,000 pound lots in the methods recommended by the Pharmacopœia. Then, again, you have to pick it out and repack it. The Pharmacopœia is intended for the apothecary, and not for the manufacturer handling large quantities.

MR. REMINGTON: Having had some experience in making fluid extracts on a large scale, I would say that their quality depends altogether upon the drug and the menstruum employed. In preparing large quantities—500 pound lots of cinchona, for instance—there is no great difficulty in making them from fine powders, and indeed from powders

finer than those directed by the Pharmacopœia of 1870, at which time alcohol was very largely employed. By using a menstruum of greater alcoholic strength, there is no trouble about it. Mr. Caspari is right as to the direction which the manufacture of fluid extracts has taken of late years. The tendency is against the use of very fine powders. But if the menstruum used with those drugs which require it were alcoholic, there would not be so much difficulty as when the menstruum is more aqueous; and you will notice, I think, by referring to the Pharmacopœia, that there has been a marked change in this respect, that the powders used therein are not so fine as they formerly were.

Mr. Ebert: Mr. Remington's remarks are very interesting to hear in the lecture room, because we want to bring up the young men in the right way. I heard the same kind of talk when I attended lectures in Philadelphia, and I came home imbued with the very same ideas that the professor imparts. I prepared my fluid extracts, and made them in quantities from four ounces up to a pound, and I made them strictly according to the Pharmacopœia. To illustrate, I made fluid extract of hyoscyamus according to the official formula, dispensed it, and nearly killed the patient to whom it was administered; and from that time to this I have been buying my fluid extracts, simply because I found it more secure to fall back on the manufacturing chemists and their reputation than on my own when legal questions arise.

I want to say, right here, that I used the official fluid extracts of the Pharmacopœia made by a certain manufacturer, whom I will not name; he does not say that all of his manufacture are strictly official, but that he makes them nearly so. I dispense these, and I fall back on his reputation whenever there is any claim as to strength.

Mr. Martindale: This discussion opens up the whole subject of fluid extracts. Professor Procter concentrated these preparations to such an extent that they cannot be made so that one fluid part represents the other solid part by weight. It is a great mistake, and I am sorry that your American Pharmacopœia has not, on this occasion, taken this matter into account. I understand from Mr. Remington (and have seen a short note to the same effect) that you did discuss, in committee, whether you should reduce these extracts to 50 per cent. I raised that point in criticising your Pharmacopœia of 1860, on the ground that there is not only a great waste of material, of time and labor, but a detriment to the drug which is to be concentrated constantly by heat; and if you make a preparation to represent it, it will not keep, because there is always a deposit formed in the liquid, which, in time, makes an unsightly appearance. I cannot agree, altogether, with Mr. Ebert's idea regarding fluid extracts. We do buy some in England, and we have been getting the American extracts to such an extent that we have, as Mr. Ebert has done, fallen into the habit of buying some; but still we make as many as we can. At the same time, you are not laboring under half the cost, as has been mentioned here. We have to pay the value of three-fourths of the spirit we buy as duty to the government. Noting the cost of your spirit, it seems to us from abroad that you are in a veritable Paradise here, as compared with us, in the expense of alcohol used in the manufacture of tinctures, etc. Every gallon of rectified spirit that we buy is under a charge of fifteen shillings duty paid to the government, I believe. Now, if manufacturers here cannot keep up their reputation for honesty and reliability in making fluid extracts—as has been mentioned by one speaker—then I am sorry for American pharmacy that it is not different.

This reminds me of another point. A number of experiments have been conducted by several chemists in England (two in particular, Messrs. Fair and Wright) on the official value of the products not only of tinctures, but also of fluid extracts—more especially tinctures—to ascertain to what extent they are representative of the products from which they have been obtained. I am afraid the official value, or the medicinal value, of many of the fluid extracts sold is nothing like what is supposed to be their strength as

one to one. I am therefore sorry that you have not seen your way clear to make 50 per cent. preparations, so that if it had been possible a preparation could have been made to represent the drug, one to two. We are sorry that you have not arranged this in your Pharmacopœia, because it would have been very convenient for the retail pharmacist and the wholesale manufacturer. The retail pharmacist would then have been better able to make his own preparations. In Great Britain, we make our own preparations where they are official, but we also have to purchase them from the great manufacturers, and frequently they have special manufacturers' names put to prescriptions, which compels us to buy them and prevents us from making them.

MR. GOOD: I would like to say a word in regard to the honesty of manufacturers—not that I want to stand up for them in all things, but I have always maintained that the quality of the drugs dispensed depends on the apothecary. I maintain that it is possible for every pharmacist in this country to obtain, from reliable sources, a supply of drugs which can be relied upon as medicinally pure and of good, fair strength. The question of what shall be dispensed, I think, depends very largely on the discretion, the care, and the amount of money the retail apothecary himself is willing to expend. He can get good drugs if he wants them.

Now, I want to ask Mr. Patch one question about the fluid extract of belladonna. Do I understand you to say that the menstruum used for making the fluid extract of belladonna root is 68 per cent. alcohol?

MR. PATCH: I think the new Pharmacopœia indicates about that amount, as I recall it. I can give no reason as to why the menstruum was reduced by the Committee of Revision. It has been 91 per cent., but it was impossible, so far as I know, to find, in the market, a fluid extract of belladonna root that was made with 91 per cent. alcohol. I suppose the manufacturer had learned that by using a weaker alcohol he could get a product quite equal, if not superior, in alkaloidal power. But there was this objection to it, that while the pharmacopœial standard remained 91 per cent. and the fluid extract was official as the basis of belladonna liniment, when the pharmacist undertook to make the liniment of belladonna by adding camphor to the fluid extract, it did not dissolve and it was sent out in that way. The physican complained to the pharmacist, but he had made it officially, and had taken so much camphor and so much fluid extract of belladonna. I can add that we have proof rather more convincing than this, for in submitting a fluid extract of belladonna to a large number of pharmacists to determine whether or not it was suitable to be dispensed, every one declared that he had never seen any fluid extract of belladonna like it, because it was so light in color. The 91 per cent. alcohol extracted a portion of the coloring matter in the drug, and that made the difference. The committee, I think, came to a wise conclusion in reducing the alcoholic strength to 68 per cent., as they have done away with the linimet of belladonna, if I remember rightly; but so long as they used this in making liniment of belladonna, they should have used the strong alcohol, otherwise they could not dissolve the camphor.

MR. HALLBERG: I think I can further answer the query in regard to belladonna, propounded by Mr. Good. The use of strong alcohol as a menstruum for most drugs for fluid extracts is almost purely theoretical. There is scarcely a drug, not even the most resinous, for which it is necessary. There may be a few resinous drugs, like podophyllum, which may be extracted with strong alcohol if completely exhausted; but with the great majority, and in every instance where the active principle is alkaloidal or particularly when it is glucosidal, a considerable proportion of water is absolutely necessary to completely exhaust the drug of its active principles. Take aconite, for instance. A menstruum which will exhaust aconite root better than the present one employed is alcohol of 85 per cent. This is also true of belladonna root. We have always gone to one extreme or the other in the selection of the menstruum; that is, it should be either

strong or diluted alcohol. In fact, the Pharmacopœia, even in 1880, was not by any means a perfect guide to the best menstrua for fluid extracts; and this being the case, how can you blame the manufacturers? I know that one of the largest concerns in this country positively endeavored to conform to the Pharmacopœia in the manufacture of fluid extracts and sent out fluid extract of cotton root prepared according to its requirements, but in a very short time there was invariably great precipitation in it. When it was suggested to them that by eliminating the 30 per cent. of glycerin in the alcohol, either entirely or at least using only 10 per cent. instead of 30, the exhaustion would be equally well effected, and precipitation be prevented, this course was followed with satisfactory results. Now, there were a number of formulas in the U. S. Pharmacopœia of 1880, which were unsatisfactory; but if a manufacturing pharmacist, after having received complaints regarding his fluid extracts, by reason of precipitation, should improve upon this particular process of menstruum, the question might be raised (as it was raised some three years ago by Mr. Lloyd in connection with the anti-adulteration law of Ohio) as to whether he has a right to make an official preparation with a menstruum differing from that which the Pharmacopœia prescribes. I believe, according to the construction of the Ohio law, he would have to use the menstruum of the Pharmacopœia, even if it were not a good one.

I desire to say briefly, in this connection, that I agree with Mr. Good that fluid extracts of good quality can be obtained, but when pharmacists either will not judge or are not qualified to judge as to whether a fluid extract is good, bad or indifferent, then it seems to me that they are equally responsible with the manufacturers. A certain extract manufacturing concern in this country, claiming to control the latest process of preparing fluid extracts by a kind of circulatory water apparatus, still bank on the fact that every one of their fluid extracts is made strictly by the official menstruum, namely, diluted alcohol. Another concern, not far from Philadelphia, recently made fluid extract of coca leaf with strong alcohol, when coca was about $1.50 a pound, and the fluid extract sold at $4 a pound (list). Now, when a pharmacist bought a pound of this fluid extract of coca, held it up to the light, and saw that it was about the color and consistency of essence of peppermint, his pharmaceutical knowledge should have told him that it was not a good preparation, that the fluid extract was not properly made, that improper menstruum had been used, and it should be rejected; but unfortunately, most pharmacists either don't know or they don't care. Fluid extract of squill as prepared by some manufacturers in this country is often so thick that in some cases I have noticed the preparation would scarcely run out of the bottle. The squill being difficult to powder, it was burned until it was like roasted coffee, and then the fluid extract was made from that. Now, the pharmacist must share the blame for this with the manufacturer; it is in his power to prevent it, and he must be more careful.

I wish to add, with reference to the oleate of zinc, that in order to obtain a powdered oleate of zinc, my experience teaches me it is necessary not to press the simple oleate before putting it up to drain and dry on the frame. In that way you can easily obtain an air-dry powder. Of course, as soon as the members of this Association become acquainted with the Pharmacopœia of 1890, they will not consider a powdered oleate of zinc, because oleate of zinc in the new Pharmacopœia, I believe, is an ointment unfortunately, and, I think, incorrectly, everything considered.

MR. LLOYD: There is one point that Mr. Patch has made in his paper which is of some interest to me aside from the remarks that have been made. I refer to the separation of a fluid extract into one or more layers after having been made. I think we have all met with this trouble, or had this experience. If we extract a drug that contains a considerable quantity of fixed oil with a menstruum that is just on the edge, when the weather becomes cooler this fixed oil is likely to separate, settle to the bottom and remain undissolved. Probably most of us have had a similar experience, during the past

few years, in making fluid extract of saw-palmetto—a good example—in which the oil settles in that manner to such an extent that upon examining a container of from five to ten gallons we have found the bottom covered all over with a pound or more of this fixed oil. The adoption of the menstrua should, therefore, in this instance, be such that the liquid will remain constant during the falls of temperature to which this preparation is subjected. There is also another reason why a fluid extract may change in strength and change from the top, and that is in consequence of the fact that it is constantly evaporating. Alcohol will evaporate from the surface, and if the container be a large one the alcohol evaporating at a considerable distance above the surface of the liquid will condense and settle to the bottom, or fall on the side of the bottle and flow down to the top of the liquid, which will thus gradually become weaker at the top by reason of this small amount of alcohol that may evaporate, condense and flow back again. If this be continued, the liquid drawn from the bottom, when the final portion is drawn from the bottle, will be found different in strength from that taken out at first: so that we have these two reasons why a fluid extract and the other liquids may change, one being the separation of a heavier substance at the bottom in the form of liquid, and the other the change of a certain amount at the top. I think this point which Mr. Patch has brought out has never been publicly stated before.

MR. CASPARI: There is one point in the matter discussed by Messrs. Patch and Lloyd, regarding the separation of the oil in the saw-palmetto, which they have not taken into consideration, namely, the amount of moisture possessed by the drug when it is used. We saturate the substances with 91 per cent. by weight of alcohol and attack the drug with it; but suppose the drug contains 10 per cent. of moisture, which is a very ordinary amount for a drug in normal condition to contain—if it does contain that amount it can be seen that the proportion of menstruum used upon it is very largely decreased in strength, which will account for a great deal of the precipitation. I am inclined to think, from some experiments I have made lately, but have not yet finished, that if the saw-palmetto can be properly dried without depriving it of too much of its volatile principles, and then treated with 91 per cent. alcohol, the oil will remain in permanent solution.

MR. CHAIRMAN: This fact was brought out by Mr. Sayre's paper, in regard to the moisture in drugs. Now, the matter of time, contact, temperature, etc., may exert a certain influence. If we expect uniformity we must establish it through practical experimentation, as shown by Mr. Patch, thus ascertaining the limits of minimum and of maximum amount of alcohol employed, and it is the only way that we can establish the facts and adopt definite formulæ. I think, therefore, that Mr. Patch's paper has given us a great deal of information, and has brought out many points which are of great value to a practical pharmacist.

MR. LLOYD: I think I may be pardoned for referring to the point raised by Mr. Remington. I believe the manufacturers will bear me out in saying that it is easier for the apothecary to obtain small amounts of official or unofficial drugs of definite strength and reliable quality than for manufacturers to obtain large quantities to work on. It strikes me that the apothecary has an advantage in that respect.

MR. PATCH: I would call attention to a point brought out by Mr. Lloyd. It has been our custom to direct our young men to shake the shelf bottle before dispensing. The rule is that they should be replenished every week, but even where this is done they should shake the bottle, for the reason given by Mr. Lloyd, namely, that evaporation from the surface of the liquid in the container would so reduce the alcoholic strength that there might be a precipitation at the line of contact of the bottle and also from the surface. But there is still another reason why precipitation occurs when a bottle is left standing for a long time: the alcohol is evaporated and subsequently condensed. At-

tention is called to the fact that this alcohol coming in contact with the surface of the drug is capable of precipitating extractive gums, etc., and sometimes the question is asked why such marked precipitation occurs in a shelf bottle. It has come from the bottle being placed on an upper shelf or in a warm situation and the contents fractioning in this way.

MR. ALPERS: I am one of those pharmacists who, to the best of their time and ability, prepare their own fluid extracts. I will not say that I make all of them—I occasionally buy some—but I try to make all I need. I make them principally because I like the work and enjoy making them. I am one of the few pharmacists who believe that their profession is not duly exercised by handing a sealed bottle from the shelf and taking a fair price for it. I believe there is more work to be done in the pharmacy, and not in the store, but in the laboratory, and I enjoy working there. I have done so ever since I went into business, and I do so to-day. My experience is that the retailer can make a fluid extract equal to that of any manufacturer and can make it cheaper, and this is the second reason why I make my own fluid extracts. I know, by experience, of course, that there is only a small demand for the fluid extract of belladonna, but nevertheless I make it up to the extent of about two or three pounds at a time. I sometimes meet with a difficulty which has been mentioned by a preceding speaker. I find that although I use the greatest care in employing the menstruum given by the Pharmacopœia, and follow the directions strictly, yet once or twice, in certain cases, I have failed to obtain satisfactory results. Probably the reason for this may be that I was not skillful enough, or perhaps the formula given in the Pharmacopœia was not perfect. However this may be, I believe that any of the tests which recent investigators provide, such as those given by Mr. Patch, will bring out any mistakes or any faults in such a valuable work as the Pharmacopœia. I believe that if every druggist would make his own fluid extracts as I do, would note results, note the difficulties he meets with in using certain drugs, and then inform the Committee of the difficulties, or, if he has the ability and time, would write papers concerning them, it would result in producing a more valuable Pharmacopœia than we now have.

There is one matter to which I hesitated to refer after Professor Sayre read his paper, but which I will mention now. It concerns the theory of life. We know that the composition of the animal body is changed the minute that life ceases, because no oxygen is brought into it. I would like to ask whether a similar change does not also take place when the life of the plant ceases, and whether this change does not continue? In a recent case in New York, where the question of the existence of an alkaloid in the human body was discussed by well-known chemical and medical authorities, this point was considered. Now, it may be questioned whether the simple fact of having different alkaloids lying inert in a plant does not change their nature, and afterwards, when the drug is used to make a fluid extract, produce a different result. This matter, I think, has not been thoroughly investigated. We know that in taraxacum there is taraxacin, inulin, etc. Will these same alkaloids be present when we use the plant fresh from the ground, or will the fact that we extract the alkaloids from it by menstruum cause these conditions? The investigations of these alkaloids are so different, and take up so much time and labor, that no ordinary chemist can devote much attention to such research. It must be left to the scientific men to determine the question, but I believe it is owing to this fact, to a great extent, that we find such different results. It is not the difference in the menstruum so much as the difference in the drugs. Some time ago, I had occasion to visit one of the largest manufacturing houses in New York. The manager of the house tried to induce me to buy his fluid extracts, and we had a long discussion. He stated to me that his house imported about 50 per cent. of the drugs that were imported into the United States during the past year. He showed me the government statistics concerning the importation of these drugs, and showed me his books in which the

amount they imported was given. He argued in this way: "Our house imports 50 per cent.; we are the largest buyers, and buy from the producers direct, in Europe, Asia and Africa. The second largest purchasers are some other large firms who buy direct from the producers in a smaller way. Then come a number of firms, represented in England or in Germany, who buy what is left, and from these firms this stuff is distributed among the wholesale druggists, and from them the pharmacists buy. Now, note the difference. We being the largest buyer get the select crop—the very best. There is no doubt whatever that we can get the best, because we can offer more and buy more. We have our own men right in the field of production, who pick out the best, and therefore we get the best, because the largest buyer can get the best, while the next best is given to the others," etc. This is what he argued, and he concluded: "What you buy from the wholesale druggist is generally very poor; it was so last year, which was the poorest year." Perhaps you all have heard these arguments; but there was evidently something to support his assertion, because he had the figures and the statistics to show for it. I, therefore, say that the pharmacist should be exceedingly careful in buying his drugs. That is where the difference lies, and not so much in the menstruum used. I have generally believed that very often a slight difference in the menstruum used will not cause such a remarkable difference in the results, although after hearing Mr. Patch's paper I would be inclined to change my opinion. Still, I believe that certain conditions make it almost impossible to determine, to the degree of one per cent., which menstruum is the best. I always adhere, as I said before, to the Pharmacopœia, although I have not always had the best results. I refer to the fluid extract of belladonna as an example. I once dispensed that as a liniment, and it was returned to me as unsatisfactory. Of course, some other druggist had dispensed a much weaker alcoholic product. I believe the fluid extract of the Pharmacopœia gives a lighter product than the one which is aqueous. I have had the same trouble with triticum; but which ones I cannot now recall, although I have taken notes. It is a fact, nevertheless, that there are certain alkaloids which will cause difficulty. That should not discourage us, however. We should see that the article is made as perfectly as possible, and if every pharmacist would only follow this plan, although there is a possibility of mistake, it would be more beneficial to pharmacy in general than buying fluid extracts from wholesalers, and shifting the responsibility on people whom we cannot reach.

Mr. Whitfield: Having prepared a lot of fluid extracts during the past few years, I cannot agree with all that has been said. Dr. Eccles made some remarks about the public, and laid the blame for these poor goods on the dear public. From an experience of forty years, I think I can safely say that the public take us at our own estimation. If we hold ourselves to a high standard, the public are bound to come to it, and accept us at our own price. If we offer them cheap drugs, they will certainly object; but if we offer them good drugs, and demand a fair price for them, they will go where they can get good drugs. I don't care how much competition and cut prices affect the trade; the pharmacist who never pays any attention to such matters will never suffer.

Dr. Eccles: I have known of five druggists, in one neighborhood, who failed during the past three years, simply because they thought as Mr. Whitfield thinks.

The following paper was read:

BEEF EXTRACTS: THEIR MANUFACTURE, COMPOSITION AND THERAPEUTICAL EFFECT.

BY C. S. N. HALLBERG.

The use of beef extract has largely increased in the Western and Cen-

tral States during the past few years because of its manufacture being attempted on a large scale in Chicago and vicinity.

The history of this manufacture is peculiar, and points a lesson which manufacturers and retail dealers may well bear in mind.

Some twenty years ago* a number of different brands of beef extracts were manufactured in Chicago and also in Texas, which upon examination were found to be very inferior in the recognized qualities of a good extract of beef. Probably because of this fact, they failed to meet the wants of customers, and also in replacing the well-known brands of South America.

Ten years later a number of semi-liquid beef preparations were put on the market here, as "Liston's" *et id omne genus*, vaunted superior to Liebig's and to contain all the nutrition of prime beef. Through elaborate advertising considerable demand was created for these as meat substitutes and dietetic agents, only to, in a few years, disappear from the market as quickly as they had been brought to notice. These differed from beef extracts in that they consisted of predigested beef and peptone, instead of the simple extractive substances and salts represented in beef extract. They were, therefore, more nutritious, since the nutritive value of beef depends on the fibrin or albumin, only obtained by extraction through digestion by pepsin and other digestive agents. Peptones, however, must be carefully prepared; and, except in the dessicated form, do not keep without the addition of preservatives which retard the digestibility, and thus defeat the very object for which pre-digestion had been effected.

These preparations were put on the market for the purposes of sale; only, however, and when, after several years use, the public could not be coaxed to buy them (even with brass band music and other devices of adventurers,) they soon faded away from public view.

The employment of beef in some concentrated form is favored by the public; and soon another attempt was made in this great beef centre to present beef in the form of the original Liebig's extract.

No sooner had one large firm begun its manufacture, than the other members of the packing combine known as the "Big Four" followed suit, so that there are four well-known brands on the market to-day manufactured in Chicago and vicinity. A tremendous effort is being made by these manufacturers to make the public believe that beef extract represents the entire nutrition of the beef, a fallacy which even many medical men fall into. This should be corrected. Liebig himself, in announcing the process, directed especial attention to the fact that the extract only represented the phosphates, kreatin and other soluble constituents, and cautioned against its employment as food, instead of the beef itself, the water-insoluble fibrin.

Aside from these considerations, it is desirable to know how these four

*A. P. A. Report of Proc., vol. xix., 1871, p. 512.

domestic brands compare with the Liebig extract. The high cost of extract of beef depends upon the fact that the yield of pure extract is only from 2 per cent. to 2.5 per cent.

The following is the process employed by me some years ago. One hundred pounds of fresh, lean beef, chopped fine, is boiled for several hours with 1,000 pounds of water. The liquid is strained off and allowed to stand 5 to 6 hours, until thoroughly cold, when the fat and gelatin separate, and are removed. The liquid is now evaporated, preferably in vacuo, until a soft extract remains. The yield was 2¼ pounds.

It will be observed that if the liquid is not allowed to get cold so as to admit of the removal of the gelatin and fat, the yield will be largely increased; this is also the case when the beef is boiled for a considerable time, parapeptone being formed, which is obtained in the extract, thus also increasing the yield. This appears to be the case with all but one of these manufactures, as compared with Liebig's.

The process employed was that employed at the Hygienic Institute in Munich,* depending upon the following determinations:

ESTIMATIONS.

1. Moisture dried at 100° C. for 36 hours. The percentage of moisture is given as 20, but these specimens dried in an oven for 24 hours, until a dry varnish-like mass remained, ranged from 8.5 to 9.25 per cent.

2. The percentage of extract soluble in alcohol of 80 per cent. vol., should be from 56 to 65 per cent. Two grammes were extracted with two successive portions of 50 c.c. of alcohol in a test-tube; the alcoholic liquid left a residue from 40 per cent. to 55 per cent. when dried for six hours.

3. The ash should be about 25 per cent., consisting of phosphates without chlorides. One gramme yielded ash, ranging from 28.65 to 31.76 per cent., with large proportions of chlorides in two. The following is the tabular exhibit:

The presence of gelatin and acid albumin, or paralbumin, or syntonin, as it is variously termed, was slight in Nos. 1, 2 and 3; considerable in Nos. 4 and 5. Treatment with strong acids showed a marked variation in the colors produced in the various extracts, emphasizing the relative position as to their value as indicated by the above described tests, standing in the following order expressed in percentages:

Liebig's	100.
Swift's	95
Armour's	85
Cudahy's	75
Morris's	50

Chicago College of Pharmacy, Aug. 10, 1893.

*R. Sendtner, Arch. of Hygiene i., 511.

PHYSICAL PROPERTIES.

No. of Specimen.	Weight, 2 oz. jars.	Color.	Consistence.	Color of Solution, 1–50.
1	2 oz.	Brownish yellow.	Firm.	Reddish brown.
2	2 oz.	Yellowish brown.	Soft.	Red.
3	2 oz.	Yellowish brown.	Hard.	Pale straw.
4	2 oz.	Dark brown.	Soft.	Reddish.
5	1¾ oz.	Very dark brown.	Not homogeneous.	Reddish.

PHARMACEUTICAL PROPERTIES.

No. of Specimen.	Moisture, %, loss 100° C.	Extract, %. Sol. Alcohol, 80 %.	Ash, %. (fr. 1.0.)	Const. of Ash.	
				Phosphates.	Chlorides.
1	9.25	55.	31.76	Large.	None.
2	8.75	49.	29.33	Large.	Large.
3	9.	55.	30.47	Large.	Trace.
4	8.5	40.	28.87	Small.	Small.
5	8.5	40.	28.65	Small.	Large.

COLOR REACTIONS.

No. of Specimen.	HNO_3.	H_2SO_4.	$\{HNO_3\}$ $\{H_2SO_4.\}$	Fuming Nitric Acid.
1	Yellow.	Brown yellow.	Slate brown.	Brown yellow.
2	Red yellow.	Brown.	Brick red.	Brown yellow.
3	Gold "	Red brown.	Terra cotta.	Light yellow.
4	Brown "	Brown.	Brown red.	Brown.
5	Brown.	Dark brown.	Dirty brown.	Dark brown.

Some discussion followed the reading of this paper in regard to the appearance in it of certain names mentioned by the author in connection with his examination of beef extracts. The manufacturers' names were given in the paper upon its presentation to the Section. Some members objected to this, claiming that it would be unwise to use such names, because it was contrary to the custom of the Association, which provided that numbers instead of names should be used in designating the various specimens examined. If the names were given, parts of papers of this kind might be extracted by manufacturers and used for advertising purposes, as had been done in certain cases; or they might send representatives to the Association to read papers in which their goods were recommended and those of competitors condemned. It was intimated that in case of unfavorable criticism the Association might become entangled in a libel suit. A number of other members, however, favored Mr. Hallberg's procedure, and stated that without the names a paper of the kind was almost worthless, for the pharmacist who sold beef extracts would then have no means of knowing which were of good quality and which contained injurious properties.

Mr. GOOD finally moved that the author of the paper be requested to designate his samples by number only, and omit the manufacturers' names. The motion was seconded and carried.

Mr. Wellcome read the following paper:

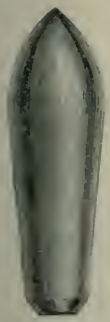
AN IMPROVED SHAPE FOR SUPPOSITORIES AND BOUGIES.

BY HENRY S. WELLCOME, LONDON, ENGLAND.

The use of suppositories and bougies as vehicles for medication and alimentation has undoubtedly greatly increased during the past few years, but it is a very remarkable fact that since the first introduction of suppositories into pharmacy there has been scarcely any improvement in shape.

The ordinary cone-shaped suppository which has so long done duty is easily inserted, but often more easily expelled, and this great defect has caused the most aggravating annoyance and disappointment to both physicians and patients

Fig. 5.



Rectal Suppository.

When a suppository of the ordinary shape is introduced into the anus, or fundament, the lower extremity of the great intestine, the pressure of the muscles which are peculiar to the *sphincter ani* act entirely with expelling force, unless the suppository is introduced a considerable distance into the rectum. Even then, the *levatores ani*, which serve to dilate and draw the anus up to its natural situation after the expulsion of the faeces, fail to grasp the suppository when introduced small end first, on account of its unreasonable shape; in fact, the old suppository has always been introduced wrong end first.

A double-cone-shaped suppository has been devised which is certainly an improvement over the ancient form, but this does not in all cases insure retention, as the double cone form only secures about equal division of the retaining and expelling force of the *sphincter ani*.

I have designed a Suppository which I believe fully overcomes the difficulty; it is practically the reverse of the old shape. This improved suppository is formed with a thick bulb abruptly pointed at the apex like a fat cigar or minie bullet, and gradually tapered at the base.

A forty-five grain Cacao Butter Rectal Suppository of this shape is one and a half inches in length and half an inch in diameter at the thickest portion of the bulb, the thickest portion being half an inch from the apex and one inch from base. The base is one-quarter of an inch in diameter, and is cut off transversely. The taper both to the apex and to the base has a somewhat bulbous curve, as shown in the drawing herewith, and by the patterns exhibited.

Fig. 6.

Urethral Bougie.

This Improved Suppository is inserted with the thick bulbous head fore-

most, and by the reflex contraction of the *sphincter ani* not only is expulsion prevented, but the suppository is naturally held in position. The entire muscular force acts to retain and press inward.

These suppositories of my design have been tested in one of the principal London Hospitals with unqualified success. I apply this same shape suitably modified for vaginal suppositories, also with suitable modifications, for urethral bougies. See drawings and specimens herewith.

Any pharmacist who desires to please the medical profession, and greatly benefit those for whom he dispenses—to say nothing of his own profit from enterprise—may by a small outlay procure moulds for preparing suppositories of this shape from any mould maker—they are neither registered nor patented.

The next paper read was the following:

ON THE ATOMIC WEIGHTS OF THE CHEMICAL ELEMENTS.

BY DR. GUSTAVUS HINRICHS, ST. LOUIS, MO.

The history of pharmacy during the century now drawing to a close has been marked on account of the gradual displacement of crude and complex drugs, variable in character, by their active principle, possessing a definite chemical composition. It is reasonable to suppose that in the future nearly all remedial agents in use will be perfectly definite chemical compounds. A large majority are so to-day.

But a definite chemical compound, when pure, is the material expression of a chemical formula, in which the symbols used represent perfectly definite weights, called the atomic weights, of the chemical elements specified.

Accordingly, the numerical values of these atomic weights are quantities of the highest practical value to every pharmacist of to-day, and are bound to become even more so in the future.

For nearly a century chemists have endeavored to determine these atomic weights. The names of Berzelius and of Dumas are most prominent in this great work till about thirty years ago, since when the work of Stas has been accepted with admiration—and almost without serious question. But the results of Stas sharply contrast with those of his precursors. Stas claims to have demonstrated that the atomic weights of the chemical elements are not exact multiples of that of hydrogen; therefore the earlier atomic weights, being whole numbers (and two or three halves used by Dumas) have been generally discarded.

With the surrender of the simple atomic weights great confusion has taken the place of universal accord. It seems, therefore, timely to consider this question from the standpoint of the pharmacist. Are the differences of sufficient magnitude to require the pharmacist to take notice thereof? Are they not simply of interest to the specialist in chemistry? A very careful examination of this entire subject has convinced me that there is no reason to discard the old and simple atomic weights in phar-

macy or in general chemistry; and further, that these really are the exact values of the true atomic weights, the whole series of the work from Stas on being affected with errors that have been overlooked thus far.

Taking up the examination of this matter, we must, first of all, exclude as misleading and unworthy of a place in science, the entire system of atomic weights introduced by Meyer and Seubert in their special work published in 1883. They adopt the atomic weight of hydrogen as the unit of their system. They calculate from Stas and others for oxygen, 15.96, silver, 107.66, lead, 206.39, and so forth.

But it is a fact that should be known to every chemist that the atomic weight of hydrogen is precisely the most uncertain of all; it is therefore absurd to use it as standard or unit, because every new determination of the same will compel a corresponding change of all the others. As the atomic weight of hydrogen is uncertain to the extent of one per cent., that is also the change that all other atomic weights are exposed to. This amounts to a full unit for silver, and to two full units for lead. That is, 200 in the second decimal place!

To-day the tendency of chemists is to consider the determination of the atomic weight of hydrogen made by Morley as the most reliable; thereby that of oxygen becomes 15.88 instead of 15.96 of Meyer and Seubert; accordingly all these atomic weights would have to be reduced one-half of one per cent. If we on the contrary adopt the determination of Keiser, made by burning hydrogen at common temperature in the presence of palladium, we would have to increase all the values of Meyer and Seubert by one quarter of one per cent. Instead of representing the fixed atomic weights properly by some reasonably stable numbers, the atomic weights of the chemical elements on this system are constantly fluctuating, as are the quotations of silver on change.

There remains thus only the system of atomic weights on the basis of oxygen 16. Then according to Stas the atomic weight of silver is 107.93, which differs from the round number formerly used by 0.07 only. This difference is absolutely without influence on any practical operation, either in pharmacy or general chemistry; indeed, it has taken all the much admired skill and years of labor of Stas to determine this difference, if for the sake of argument we temporarily admit that he did not blunder. But we may say right here, that the means of this difference, according to the best calculations, run from 0.02 to 0.13; showing that the range of uncertainty amounts to nearly 150 per cent. of the total determined, a result that can only be considered well established by those who are blinded by admiration.

Surely there is no reason to discard the old whole-number atomic weights from general chemistry, and most assuredly no excuse for the introduction of the fractional moderns number into pharmacy. We can properly say that the atomic weight of hydrogen is 1, of oxygen 16, of nitrogen 14,

of sulphur 32, of silver 103, of lead 207, and so forth, precisely as did Dumas thirty years ago. In the case of a very few elements, the half is required; thus, chlorine has the atomic weight 35.5, copper 63.5.

I believe in progress; but mere change may set us back. I rejoice when truth replaces error; but when error crowds out truth, it is our duty to protest. Scientific education is constantly extending; but as the current widens it is likely to become shallow. The modern history of the atomic weights has revealed several places of very little depth. One of these is at that German university where the system of gambling in atomic weights was devised; another developed some two years ago, when an officer of one of the scientific bureaus at Washington would prescribe what atomic weights should be used by the pharmacists for the next year. The chemist in question stands in a place almost as shallow as that where we found Meyer and Seubert. The paternalistic care of the pharmacists was particularly out of place. It would indeed be a bad thing for pharmacy in the United States if its own questions could not get an answer within its own shops and schools. As to the broad question of prescribing by government authority what is to be the truth, it is a method that was tried some three hundred years ago by a body much wiser, much abler, and above all possessing a power which, it is to be hoped, never will be attained by any organization whatever on this continent. We all know that the attempt in 1633 was a failure. Each attempt of that kind, however small, should be stamped out, and not simply passed by with silent contempt.

Here we might properly close this paper; but I ask permission to add that I have in recent contributions to the Comptes Rendus of the Academy of Sciences of Paris shown, that the results of Stas really are erroneous, and that the simple whole number atomic weights are the true ones in fact.

The general philosophical importance of this subject is of the highest order. If the minute differences which Stas claimed to have established, and which find their expression in the fractional atomic weights, are real, then the different chemical elements cannot be referred to one single kind of matter. But if the small differences found by Stas were due to slight errors in his work, and if, therefore, the atomic weights are exact multiples of that of hydrogen (or in a few cases half of this) then the different elements are built up of one and the same kind of matter, only the number and form of the element atoms differing.

The question involved in this subject of the precise value of the atomic weights of the elements, therefore, is none less than the question of the Unity of Matter. This I claim to have solved in the affirmative in the papers referred to.

DR. ECCLES: The writer of this paper has, it seems to me, reversed the process of inductive science by starting out with a theory and not facts. This is a very common failing of the race and one that most of us are less or more subject to. As he has guessed

that all atoms bear some simple ratio to each other in atomic weight, and by referring them all to hydrogen as one, oxygen is supposed to be sixteen and all the rest equally perfect round numbers. In my early studies as a chemist I was imbued with the same idea, and cannot say that I have fully shaken it off yet. When, however, we see chemist after chemist who has actually undertaken the true determinations, giving up this assumption, as did the well-known Professor Clarke, formerly of Cincinnati, we are compelled to waver and come back to the true scientific method of accepting the facts and discarding theory. Our facts may be misleading; but so long as we have nothing better, we must abide by them. My faith in the simple mathematical ratio of the elements was badly shaken by the experiments of Professor Crookes, of London, England, wherein he fractionated the elements and found that even the same element did not always have the same atomic weight, just as we can separate a crowd of men, putting all the big ones into one room, and all the little ones into another; and, although they are all men, a hundred of the large ones will weigh far more than a hundred of the small. Crookes found that by his process the same element could be so sifted that volume for volume they would not agree in weight. Dr. Hinrichs asserts that the simple ratio is the true one. Where are his proofs? Those who have actually experimented on the matter at all, so far as I have heard, deny it.

Dr. Hinrichs: Mr. Crookes has done nothing of the kind, He never made an atomic weight determination except in the case of Thallium, and that case is not in question. This so-called differentiation of one element into another, Crookes pretends to have executed with reference to certain of the rare earths whose elements no chemist of reputation has ever dared to positively define. That is a phase of the matter that is still in the clouds, and it has not come down yet. But as to the atomic weight of hydrogen, that is a perfectly definite question of weight, as all chemists know. For the past fifty years the most advanced chemists have been at work to determine the precise, fixed ratio, but hydrogen is the lightest of gases, and it is difficult to keep it in any vessel on account of its tendency to escape. It is exceedingly difficult to obtain pure hydrogen. Nobody has ever claimed, I believe, to get it in a pure state; but whether that is true or not, is not for me to say.

Now, as to the determinations that have been made on hydrogen with reference to oxygen, which is more easily handled, and therefore by nearly every chemist are now taken as standards, we have the ratio of hydrogen—Morley puts it at about $\frac{8}{1000}$ over unity, oxygen being taken at 16. Another authority puts it at $\frac{6}{1000}$ over, We have some claiming that it is only $\frac{2}{1000}$ over the unit 1. Which of these is right? That is the question. Hence, the standard of hydrogen is given up. Now, there are, as I said, possible methods of determination by the method of Grüik, a method by which we can make ourselves independent of error and come to a perfectly fixed result. That my friend Clarke, of Cincinnati, made that investigation is well known to me. He calculated like all the rest. Until now, they have overlooked certain errors; that is, when we weigh a certain amount of an element we put that in the equation as such (as Clarke did and all the others did). We all know, and every chemist admits it, that we cannot perform a single experiment with absolute accuracy. No one pretends that he can. The question is one of figuring out how we may make ourselves independent of the error, but that would be technical, and I would not pretend to enter upon the subject. Crookes certainly never made a determination of the atomic weight of any element but the one he discovered, Thallium, and he has not differentiated hydrogen into anything else. Today, there is no chemist who holds that what we call hydrogen is not one and unchangeable, so far as our present experimental means can reach.

Mr. Ebert: About thirty years ago, I had the pleasure of learning that Dr. Hinrichs was working on this subject, and I am pleased to find that he is still at work. He is cer-

tainly entitled to our thanks for presenting such a very able and interesting paper, giving us the result of his investigation on such an important a subject.

The following paper was read:

BOUGIES.

BY NICHOLAS PRITZKER, PH. G.

THERAPY.

From a therapeutic standpoint bougies are very desirable and preferable to injections, because:

They bring all the medicaments to the affected parts while the patient is about his vocation, not taking him from the latter except for a short time during the administration.

None of the medicament is lost, all being utilized if the bougie is properly prepared.

Substances insoluble in liquids can be incorporated in a bougie, being solid.

It is safer as no stricture need result because the necessary amount of drug can be incorporated, and nearly all of it absorbed.

PHARMACEUTICAL VALUE.

To be of importance to the druggist, however, bougies should be of such character as to admit of being formed in the laboratory with such implements as are already to be found there or easily attainable at a small expense and on short notice. Bougies requiring expensive outlays for apparatus and tedious processes are not only useless, so far as the average pharmacist is concerned, but even pernicious to the latter since they add to the monopolizing "proprietor" who always claims "superior facilities" for manufacturing.

To sum up, therefore, bougies should be:

(*a*) Readily absorbable and fusible at the temperature of the body, yet not so quickly that the material will run out before it has had its required action.

(*b*) Flexible and malleable.

(*c*) Miscible with such drugs as are usually prescribed for such cases.

(*d*) Constructed on simple principles with few appliances and made rapidly on short notice.

The bases so far suggested do not seem to meet with the above requirements, lacking in one or more essential points; gelatin for instance, while flexible and malleable, cannot be made quickly and easily, nor are gelatin bougies fusible but they simply swell. Cacao butter has been suggested, but it is neither flexible nor malleable, and acts rather on the hands of the druggist and patient before reaching the parts intended. Wax is even less

desirable than either of the former in all respects, particularly from the therapeutic standpoint.

FORMULA.

To overcome those objections and to conform to all the requirements as stated above, I have, after many various fruitless efforts, succeeded in making an almost faultless bougie by emulsifying melted cacao butter with acacia, water and glycerin.

For the most practical base I found the following formula "par excellence:"

Theobroma oil,	grains 480
Powd. acacia	" 240
Water	min. 240
Glycerin	" 120
Powd. boric acid sufficient.	

Melt the cacao butter and triturate in a warm capsule with acacia; add the water previously mixed with the glycerin; place the capsule in cold water or on ice until the mass has solidified, and set the vessel aside. When required for use, take of the above four drachms, incorporate with medicaments and from 10 to 25 per cent. cacao butter, triturate until intimately mixed, and roll out into 10 bougies.

To further simplify the handling of the bougies a OO empty capsule may be placed at one end of the bougie, so that in holding it will not melt. Thirty-five per cent. glycerin may be incorporated with this base in making the suppositories; this does not interfere with the addition of such powders as may be needed. As a substitute for cold cream, or as a salve for lips, hands, or face it is not to be improved upon. However, for the different uses different formulas are to be preferred. As a lip and face preparation more base and glycerin and less or no acacia is wanted, while as a base for salves but little of the glycerin and a trace of white wax is advisable.

When dry powders are prescribed in bougies, these should be incorporated with an equal amount of glycerin.

I may further state that many physicians have found the above mixture a far more desirable base for suppositories than the pure cacao butter. Directing attention to this may prevent some ingenious proprietary manufacturer from bringing forth a substitute for cacao butter under some clever name as "bugioleine," thereby taking profit from us and our science.

The Section adjourned to 8 p. m.

SECOND SESSION.—TUESDAY EVENING, AUGUST 15.

The Section met at 8 o'clock.

The minutes of the first session were read by the Secretary and on motion were approved.

The first business taken up was the election of officers for the ensuing year. No further nominations being made, the Secretary was, on motion of Mr. A. B. Stevens, directed to cast the ballot of the Section for the nominees presented at the previous session. The Secretary cast the ballot and Messrs. Sayre and Ford were declared duly elected Chairman and Secretary for the ensuing year.

The reading of the papers was resumed, the following being first presented:

ON THE PREPARATION OF OAK TANNINS WITH REFERENCE TO THE SPECIAL USE OF ACETONE AS A SOLVENT.

BY HENRY TRIMBLE AND J. C. PEACOCK.

The usual method for preparing a tannin from a substance as rich as nutgalls, or containing from 60 to 70 per cent. of the astringent principle, is to extract with a mixture of alcohol and ether, or, what amounts to the same thing, official ether, specific gravity 0.750. When, however, the material is an oak bark, containing from 4 to 15 per cent. of tannin, the choice of a proper solvent becomes a more difficult matter.

During the past year a number of experiments have been made on oak bark with a view of determining the most satisfactory solvent for the tannin. The following are especially worthy of consideration:

(1) Official ether, specific gravity 0.750, which is equivalent to a mixture of alcohol and ether.

(2) Acetic ether.

(3) Water.

(4) Acetone.

The greatest objections to ether are its expense and the slowness of its solvent action, which latter consumes time as well as a large amount of menstruum.

Acetic ether is a much better solvent, and the expense is the chief difficulty here in the way of its use.

Water is slow in its solvent action; this, however, is in part overcome by long maceration, and then slow percolation. The tannin must be separated from the resulting aqueous solution, either by agitation with acetic ether, or by precipitation with lead acetate. In the latter process it was found possible at a considerable sacrifice of oak bark to procure a quantity of light-colored tannin, by precipitating one-half of the aqueous percolate with lead acetate, collecting the precipitate, stirring it through the other half of the percolate, and then filtering. The filtrate was very light in color, and was either evaporated under reduced pressure and submitted to

further purification to be described hereafter, or it was agitated with acetic ether, and, after removal of the latter solvent, purified in the same manner.

Apart from the slowness of this process, the yield of tannin after purification was always small when water was used as a solvent.

Within the past few years acetone has appeared in commerce in a nearly pure form. Its solvent action has been suggested for several plant principles, but thus far little, if any, reference has been made to its use as a solvent for tannin, although there is good reason for believing that some manufacturers are using it for the extraction of nutgalls. It is cheaper than ether, but more expensive than alcohol. It is a better solvent of tannin than either of these, and extracts the tannin with less sugar and other carbohydrates, because of its poor solvent power over these. Its low boiling point, 56.5° C., renders its recovery easy and rapid, without danger of decomposition to the tannin.

From a sample of powdered nutgalls, commercial ether extracted 59.77 per cent. of solids, while acetone extracted 62.24 per cent. of the same.

The following process, after some preliminary experiments, has been devised and thus far proven satisfactory.

The powdered oak bark was well moistened with acetone, packed in a glass percolator, and the menstruum poured on until it commenced to drop from the lower orifice, when the latter was closed with a cork, and the bark allowed to macerate for forty-eight hours. Enough of the solvent was poured on before maceration commenced, to keep a thin layer of it above the drug. A glass plate smeared with petrolatum was kept on top of the percolator to prevent evaporation. At the expiration of the maceration period, the stopper was removed and the percolation continued rapidly until the number of liters of percolate amounted to one-half the number of kilograms of oak bark used. The latter was then usually found to have been exhausted. In some instances a Number 20, in others, a Number 40 powder, was used. In every case the acetone rapidly penetrated the drug, and accomplished complete exhaustion. The acetone was removed by distillation, the first portion on a water bath, under ordinary conditions, but the last portion by the additional aid of reduced pressure. The residual product was a dark red or brown semi-solid extract. This was warmed with water until nearly all of it dissolved. After cooling, the whole was filtered and the clear filtrate was diluted with water as long as precipitation took place. This dilution separated much of the anhydrides. The filtrate from these was of a clear, red color and yielded no further precipitate on the addition of water. It was agitated successively with acetic ether. The acetic ether portions were mixed and the solvent recovered by distillation under reduced pressure, which yielded the tannin in a porous or "puffed up" condition. The product was then treated with cold water, and, after filtration, was again separated by agita-

tion with acetic ether. This process was continually repeated until the tannin was readily and completely soluble in water. The tannin then possessed considerable odor of acetic ether, which was removed by solution in official ether, specific gravity, 0.750; and, after filtering clear, distilling off the solvent under reduced pressure. The product was then digested with absolute ether, which dissolved the small amounts of adhering resin and crystalline principles which occur along with it in the bark, or result from decomposition when working it, and the tannin remained behind nearly pure, and readily and completely soluble in water. This process was carried out on barks from the following species of oaks: *Quercus alba*, *Q. coccinea* and its variety *tinctoria*, *Q. falcata*, *Q. palustris*, *Q. Prinus*, *Q. bicolor*, *Q. stellata*, *Q. Phelles*, *Q. rubra*. It was found in some cases that by dissolving the acetone residue in a mixture of four parts water and one part alcohol, instead of water alone, that there was less formation of anhydrides.

A few trials were made with a modification of the purification process in which the first acetic ether residue was dissolved in water and filtered through a freshly prepared lead compound obtained by precipitating a portion of the aqueous solution of the bark with lead acetate.

In some instances the resulting filtrate was nearly colorless, but the loss of tannin was such as not to warrant the adoption of the process for general use. It might, however, be applied in certain cases with satisfactory results. From the colorless filtrate the tannin should be removed by agitation with acetic ether, and the remainder of the general purification process then carried out.

MR. BARTLEY: I should like to ask, for information, whether the samples exhibited by Mr. Trimble have changed color since they were prepared?

MR. TRIMBLE: No, sir; they are just as they were finished. They were then as dark as they now are.

MR. BARTLEY: Then you think that all the samples are equally pure?

MR. TRIMBLE: The difference in color is owing to their source and not to impurity.

MR. SAYRE: Is it not possible to remove the color from the tannin without injuring the composition of it materially?

MR. TRIMBLE: I think it has probably been carried as far as practicable in this case. Our process of purification from the color, we found, was attended with some loss, and the specimen you specially indicate is the last. The loss was not so great in that case, and I think the color belongs to the tannin. There is a little difference in the various species. There is one known as the pin oak, in our part of the country, which is very light, and we cannot account for it. I should state there is also a sample here, which is put in for comparison, from the ordinary chestnut (castanea) bark.

DR. ECCLES: Are they all genuine tannins, or do some of them vary in their chemical composition. Are all glucosidal, or some non-glucosidal, or are they mixtures?

MR. TRIMBLE: We have hardly decided as to the composition yet, but if I may proph-

esy a little, I do not think they are glucosides at all—none of these, at least—from the experiments we have already made.

MR. LLOYD: I think we have all been much interested in this line of investigation that Mr. Trimble is making with tannins. He certainly is very persistent and enthusiastic in this work. I am particulary pleased to find that he has taken up a new menstruum. I think we may say that some of our members have been investigating menstrua or solvents which they have not, as yet, ventured to bring before the Association, and I believe that as manufacturers of medicines we have followed our leader too long in confining ourselves almost exclusively to alcohol or alcohol with water and glycerin, in making our medicines and extracting our drugs. Now, there are other solvents, and Mr. Trimble is stepping over into a field that will unquestionably be a great one to the pharmacist of the future—that is, the use of neutral solvents by means of which these substances can be separated without the application of chemistry. I would again venture to say that if Mr. Trimble will experiment with other solvents he can, perhaps, take the color out of those substances without injury. Before he stops his work in this direction, I would like to suggest that it would be well for him to investigate the red-bud, which is so exceedingly astringent, and place that among his tannin products. I consider this an excellent paper.

MR. SAYRE: As I was not present when the first part of this paper was read, I would ask the author whether it includes the reactions with salts of iron of the various tannins?

MR. TRIMBLE: This paper does not. I shall have to reserve that for future work.

MR. HALLBERG: Will you please state briefly what it does include?

MR. TRIMBLE: The preparation of tannins with the idea of emphasizing the use of acetone. Oak was taken because we are working on oak-bark. I wanted to bring forward the matter of acetone as a solvent, and prepared this paper partly as a means of doing so. Now, there is abundant room for others to work on acetone as a solvent for other principles. There was an article published about a year ago, I think, in the American Journal of Pharmacy by Mr. Beringer on the use of acetone for making oleo-resins; and specimens that he showed at the Philadelphia College of Pharmacy, at that time, were certainly very superior products. I did not like to venture on the price of acetone in the paper, and did not mention it, because it varies somewhat, and has decreased considerably since I began experimenting. I can only say this, that the acetone of which the samples here were made is what is sold by some of the makers of chloroform as chemically pure, and it ranges in price from about $2.50 a gallon upward. As it has rapidly declined in price for the past few years there is reason to believe that it will eventually be offered at a much lower price than that, if it can be employed for any purpose other than that of making chloroform, which is its principal use at the present time.

MR. HALLBERG: I desire to emphasize the remarks made by Mr. Lloyd regarding the conservatism of pharmacy with respect to the use of liquids for menstrua. I have found that the percentage yield of extracts of drugs is very much reduced by using menstrua, for example, of alcohol and chloroform, or alcohol, chloroform and ether, like the Prollius fluid. A menstruum of this kind is used in certain laboratories where a very small percentage of extract from the drug is obtained by the addition of inert powder like sugar of milk, producing a powdered extract which would be of about the strength of the ordinary solid extract. I demonstrated this a year ago, at the time I was experimenting on this subject, and I intended, if I could secure the right quality of acetone, to use it for this same purpose. Probably methyl-alcohol can be employed. I think we ought to work in that direction instead of confining ourselves simply to alcohol and water in the different proportions.

Dr. Eccles: Why doesn't Mr. Hallberg try to obtain the extracts if he can accomplish what he says. There are a number of solid extracts that after being powdered, consolidate again and grow hard, and the abstract would save that. If we could have an abstract without considering the extract why not have it?

Mr. Hallberg: There is a long story connected with this, and one that I have no desire to inflict on the Section. I only wish to say that although I was not appointed a committee on abstracts, Professor Remington requested me to take up the subject, which I did. The work was delayed considerably, and the results probably did not appear in time for incorporation in the Pharmacopœia, but I did succeed in making all the abstracts (nux vomica excepted) of the strength of the present official solid extracts in what, I believe, is a permanently pulverized form, by using a menstruum of 75 parts alcohol and 25 parts chloroform. Tri-turation with sugar of milk brought it up to four times the strength of the drug, in the case of nux vomica. The given percentage of chloroform extracted, of course, all the fixed oil, and for that reason it was not practicable. To my idea, the abstract should have been retained in the Pharmacopœia, but the committee, probably, was too conservative to use a menstruum of this character.

Dr. Eccles: The point I raise is this: Why do you suggest that anything of the kind was ever presented to me? I have known nothing of it.

Mr. Hallberg: After a great deal of experimental work, for over a year, more or less, involving the extraction of all sorts of extracts with methyl-alcohol and ether and alcohol, in various proportions, I sent in the report to the chairman who had charge of the sub-committee work, and that is the last I ever heard of it.

Mr. Herath: Without knowing anything about the paper, having been absent while it was being read, I would throw out a hint in regard to making aqueous extract of opium. The aqueous extract of opium is always a very difficult preparation to handle, especially in summer. It is difficult to weigh and gets soft, even when it is very hard after you have made it. Now, if you will, when making aqueous extract of opium, treat the aqueous solution—not too concentrated—with petroleum benzin and shake it up with that, you will remove from it all that resinous principle that seems to be in it, and has the tendency that when the extract is evaporated to dryness, of again becoming of a pasty condition. I have found it very desirable to get the aqueous extract of opium in a pulverized condition by shaking the alcoholic solution with petroleum benzin. A paper read at Indianāpolis, a few years ago, by Dr. Sloan, discussed this method of treating opium. It was in the line of experimenting with an aqueous extract, or rather deodorized tincture of opium, and Dr. Sloan maintained that petroleum ether removed the foreign impurities. I think he demonstrated, from several assays of the product, that part of the impurities were removed by this process.

Mr. Ebert: I would reply to that statement regarding Dr. Sloan's experiments, by saying that in 1864 or 1865 I first suggested the use of petroleum benzin for making deodorized tincture of opium and denarcotized opium. I have made, say 100 gallons, since in that way, and have tested hundreds of specimens, and have yet to find that benzin extracts one particle or trace of morphine. I want to state what it does not extract, and what ether does extract from opium, and which ought to be left in the deodorized tincture of opium, and that is *narcotine*, which is not a narcotic, as we know, but a tonic and should remain in the opium preparations. I think it has been demonstrated that narcotine in five grain doses is equal to about two grains of quinine, and this is one reason why deodorized tincture of opium, and in fact all opium preparations, should contain narcotine. The name, however, is a misnomer, for it is a tonic and not a narcotic.

MR. HERATH: My impression was very strong that Dr. Sloan stated the impurities were removed, but I may have been mistaken.

The following paper was read by the author:

CAULOPHYLLINE.

(From the Root of Caulophyllum Thalictroides.)

J. U. LLOYD.

History.—In 1863 (Am. J. Ph., 1863, p. 99), Prof. F. F. Mayer stated that the alcoholic tincture of this drug gave alkaloidal reactions, his words being as follows: "The alcoholic tincture left to spontaneous evaporation deposits a white granular substance in considerable quantity. The deposit washed with dilute acid, *which dissolves a colorless alkaloid.*" Prof. Mayer thus states positively that an alkaloid is present, but so far as I can learn, made no further reference thereto, leaving the matter indefinite, no specimen being exhibited.

In 1864 (Am. J. Ph., 1864, p. 203), Prof. A. E. Ebert searched for this alkaloid and failed to obtain it, inferring that the drug used by Mayer was contaminated with Hydrastis or some other alkaloidal drug, and his views were generally accepted.

In 1887 (D. & M. of N. A., vol. II., p. 154), the writer verified Mayer's statement, named the alkaloid caulophylline, and obtained it in small amount, only sufficient, however, for chemical examination, all of it being consumed therein. That Mayer could have been able to *positively* identify an alkaloid by means of the test with his reagent was conclusively proven, for caulophylline responds positively with it, and it is probable that he based his assertion therefrom. That Mr. Ebert was justified in stating that the drug did not contain a crystalline alkaloid is also true at present writing, although it will probably crystallize under further experimentations. My experience demonstrates that caulophylline is of such a nature as to render it likely to disappear altogether in manipulation when searched for by methods that were in vogue when Ebert and Mayer were experimenting in this direction.

I can now state that not only does caulophylline root contain an alkaloid, but also that it is present in abundance. With methods now known to manufacturers, its nature being understood, it can be produced readily as a commercial product, should a demand arise for it. In my opinion, caulophyllum should be placed with the alkaloid-bearing plants.

Preparation.—Exhaust the powdered root of Caulophyllum thalictroides with a mixture of three volumes of alcohol and two of water. Evaporate the alcohol, and to the cold residue add four times its volume of water. Filter the mixture and evaporate the filtrate to the consistence of a thin syrup. Incorporate with the residue enough of a mixture of equal amounts of dry ferric hydrate and sodium bicarbonate to bring it to a creamy consistence. Abstract this with chloroform. Separate the chloroformic solu-

tion, and distil the chloroform. Abstract the alkaloid from the residue with dilute sulphuric acid (1 of acid to 100 of water). Bring the acid liquid to an alkaline reaction by means of ammonia. (The alkaloid does *not* precipitate.) Abstract by rotation with chloroform, evaporate to a small bulk and cautiously add hydrochloric acid (care being taken to avoid excess), stirring constantly. The proper amount of acid will produce a heavy magma of *hydrochlorate of caulophylline*. If not white, it can be purified by solution in water, filtration, addition of ammonia and abstraction by chloroform, again repeating the crystallization of the salt by the addition of hydrochloric acid.

Caulophylline is colorless, odorless, and possessed of little taste. It dissolves freely in water, alcohol, ether and chloroform. In consequence of this fact it cannot be obtained by precipitation or crystallization after the manner of most other alkaloids, for it is neither thrown out of solution by alkalies nor by admixtures of neutral solvents, and to this date has refused to crystallize from any liquid by evaporation thereof. Solutions of this alkaloid on evaporation of the solvent leave a glass-like, transparent film, destitute of crystalline structure. A chloroformic solution of *caulophylline*, to which muriatic acid is cautiously added, yields acicular crystals of *muriate of caulophylline*. When the exact amount of acid is added, if the alkaloidal solution be concentrated, a thick crystalline magma results, which dissolves in excess of acid. Some other acids form salts in like manner, but the hydrochlorate is most easily made.

Hydrochlorate of caulophylline dissolves instantly when placed on the tongue, with a not unpleasant sensation, and imparts a feeble bitterness not marked by any very sensible after taste. The other salts of caulophylline are likewise nearly tasteless. In the publication, Drugs & Medicines of North America, reference was made to the fact that this alkaloid could be crystallized as a muriate, which announcement first supported Mayer's statement made fifteen years previously, that the drug contained an alkaloid. However, the amount obtained then (1887) was small, and as Mayer did not describe the alkaloid at all, if he obtained it in substance, the specimen now exhibited is probably the first obtained in quantity sufficient for exhibition. Caulophylline may therefore perhaps properly be classed with the new proximate principles. (Specimen accompanying.)

REACTIONS WITH REAGENTS.

Solutions of Hydrochlorate of Caulophylline.

Mayer's Reagent.	Platinic Chloride.	Iodine in Iodide of Potassium.	Picric Acid.	Tannic Acid.	Phosphomolybdate of Sodium.
Heavy white precipitate.	Gradually producing crystalline precipitate. Not a good reagent.	Heavy brown precipitate.	No reaction.	Dilute solution of salt, *no* reaction. Concentrated solution, slight precipitate.	Heavy precipitate.

Hydrochlorate of Caulophylline.

	Sulphuric Acid.	Nitric Acid.	Muriatic Acid.
Cold.	Effervesces, rapidly evolving HCl.	Dissolves without change in color.	Dissolves without change in color.
Hot.	Resulting solution turns brown.	Effervesces and turns brown.	No change.

Mr. Sayre: I would like to ask whether this alkaloid has been tested therapeutically?

Mr. Lloyd: Only in combination with another drug; neither therapeutically nor physiologically alone.

Mr. Sayre: Has it been tested as a hydrochlorate and as an alkaloid?

Mr. Lloyd: It is easily made with the hydrochloric acid added to the exact quantity. The acid and the caulophylline form a semi fluid-mixture. It must be in exact equivalents and must be pure.

Mr. Sayre: Have you any opinion with regard to the physiological effect?

Mr. Lloyd: None at all.

Mr. Ebert: In 1864, I conducted a series of experiments, going over the ground that Mr. Mayer had taken up. In using the root of caulophyllum, without examining it carefully, I got the same results that Mr. Mayer obtained in his researches. He had stated, I think, that it yielded an alkaloid.

Mr. Lloyd: His statement referred to a colorless alkaloid.

Mr. Ebert: When I had, as I thought, obtained the same results that Mr. Mayer had obtained, I wanted to determine its chemical composition. I found that I had a mixture of the hydrastis salts and a glucoside. On examining the root in the market, I found it was largely contaminated. I garbled about fifty pounds of it. All of the specimens contained hydrastis canadensis. I went to work and experimented with selected root, and I succeeded in obtaining a number or specimens very similar to the specimens shown by Mr. Lloyd in color, but on examination I concluded that if it was not saponin it was a body analagous to saponin. I think I said it might be an alkaloidal principle, yet it seemed to give all the reactions of saponin, having all the characteristic properties of frothing, etc., of this glucoside.

Mr. Lloyd: This does not.

Mr. Ebert: Like many other experimenters, I felt that if I had time in the future, I would take up the sub ect again, but I procrastinated, and waited until Mr. Lloyd, in his usual way, clears away the difficulties and establishes the true facts of the case.

Mr. Lloyd: Mr. Ebert is right. The substance he discovered, and to which his name was attached, is another substance. I would have said something further concerning that substance, had it not been that Mr. Trimble is investigating it. This is crystalline; and Mr. Trimble, or one of his friends, will present a paper on it, which will be a very interesting one when it appears.

That other substance is related to saponin. It exists in considerable quantities, is white, is very acrid and froths, as you have described, but is not soluble in water.

DR. ECCLES: Is the alkaloid itself soluble in ether?

MR. LLOYD: Ether, alcohol, water and chloroform.

MR. HALLBERG: I have always believed that caulophylline contained saponin, because in drying it, I found that it is one of the most unpleasant drugs to burn. I would ask Mr. Lloyd whether he did not have an article on this subject a few years ago, in which he presented a more acrid substance than this under the name of leontin?

MR. LLOYD: That is the substance Mr. Ebert has mentioned as saponin, and the term has been applied to that instead of to this. In regard to the leontin it is, in my opinion a changeable acid which, as I have said, Mr. Trimble is working out and will present not only the method of manufacture, (for it can be manufactured and purified very easily,) but the decomposition and synthetical chemistry of it, and, as I suggested, it will be a very interesting paper.

DR. ECCLES: In working on an alkaloid it is my custom to first determine its solubility in ether or chloroform; second, can it be taken from these by a dilute acid; third, can it be precipitated from the acid solution and again taken up by ether or chloroform? On evaporating either solution I usually feel confident (although I have never taken it as final) that, if the residue after the evaporation, when again dissolved in acid, is precipitated by Mayer's re-agent or by tannin, I have an alkaloid to deal with.

MR. LLOYD: This alkaloid does not follow this course, and that is the reason it has not been separated before. It acts so differently from the majority of alkaloids.

MR. TRIMBLE: One more test might be applied, and perhaps Mr. Lloyd has done that. Does he get the odor of ammonia upon heating it with soda lime?

MR. LLOYD: Yes; I have noticed it.

MR. TRIMBLE: I think that is very conclusive evidence.

Mr. Caspari presented the following paper:

THE VALUE OF TITRATION WITH VOLUMETRIC ACID SOLUTION AS A MEANS OF ASSAYING ALKALOIDAL DRUGS AND GALENICAL PREPARATIONS.

BY CHARLES CASPARI, JR., PH. G., AND ALFRED R. L. DOHME, A. B., PH. D.

Some time since one of us (C.) made mention* of the fact that a series of investigations was in course of progress upon the subject of titration of alkaloidal residues from assays by means of volumetric acid solution. After considerable delay the work has been about completed by both of us, each working separately. As long as drugs have been assayed it has been customary to weigh the residue obtained by evaporating the final extract of the alkaloids by ether, chloroform or some other solvent, and to call it alkaloid. This is frequently accompanied by the statement that the alkaloids are or are not perfectly pure. How pure they are the sequel will very plainly show. Beckurts, Schweissinger and all the German pharmaceutical chemists have adopted titration with volumetric acid solution as the most accurate method that we at present have for assaying alkaloidal drugs, and there need be no reason why we should not adopt it, especially

* Caspari. "A Few Remarks about Alkaloidal Assays of Drugs," Pharmaceutical Review, Vol. I., page 211.

if the results of experience show how much nearer the truth we will be than when we used the gravimetric method alone. That this method is without blemish we do not claim; in fact we are candid to say there are two questionable elements which enter into the problem, though only in one or two instances, and give rise to some doubt as to the absolute correctness of our results in these instances. Even allowing that an error has been introduced, and calculating this at its maximum, we find that the result obtained by the titration method is nearer the truth than the result obtained by the gravimetric method. The two elements that enter the problem and cause us to hesitate ere saying "correct," in the cases of nux vomica, ipecac, cinchona, aconite and gelsemium, are: First, our imperfect knowledge of the molecular weights, or rather of the formulas, of some of the alkaloids, as, for instance, emetine, gelsemine, aconitine, etc., and second, the fact that some drugs (nux vomica and cinchona notably) contain several alkaloids possessing different molecular weights, and this compels us to assume that they are present in certain proportions in order to get the molecular weight from which to determine our percentage of alkaloids present. The first difficulty cannot be obviated until more exact analyses and formulas are forthcoming, and confronts us but seldom. The second difficulty can only be obviated by determining in each case by a separate assay just how much of each alkaloid is present. This presents itself in five cases, nux vomica, jaborandi, veratrum viride, cinchona and aconite. When we consider what great strides nearer to the truth we have taken in case of the remaining alkaloids (see the results below), and that we have in their cases results which we know to be absolutely correct, it is our opinion that the method of titration with volumetric acid solution is by far the most reliable method we possess to-day for assaying alkaloidal drugs. In all cases we used the fluid extracts of the drugs examined. Some trouble was experienced in getting an indicator that would give a sharp end reaction in case of slightly-colored solutions, but a decoction of Brazil wood containing a little alcohol was found to answer all purposes. Our plan of procedure was as follows:

Four separate and distinct methods of assay were undertaken in the case of each fluid extract examined, and the amount of error in each, determined by means of titration with volumetric acid solution. The methods adopted were those of Lyons, Lloyd, Beckurts and Thompson. By employing these, as prescribed in their method, we obtained the usual gravimetric results given in the columns below headed "gravimetric." The residues were then dissolved in a known quantity of decinormal hydrochloric acid dropped into the beaker from a graduated burette, using a little heat (by placing it on a water bath,) if the alkaloids resisted solution due to the presence of resin, gum or other impurities. After cooling, the indicator was added, about 10 or 12 drops, and the excess of acid determined by means of a volumetric alkali solution, whose relation to the decinormal

acid solution we knew; the alkali solution being added until the solution became cardinal to purplish red in color, indicating an excess of alkali. The number of cubic centimeters of alkali solution used were then, after being converted into their equivalent of decinormal acid solution, subtracted from the original amount of decinormal acid solution added. This gave the amount of decinormal acid that had been used to neutralize the alkaloids present in order to form with them their hydrochlorides. We know that for every 36.37 grammes of hydrochloric acid used there must be present an amount of alkaloid equivalent in grammes to its molecular weight, provided the alkaloid is a monacid base. If it is a diacid base, as in the case of ipecac, where emetine is known to be diacid, then 36.37 grammes of hydrochloric acid will neutralize, *i. e.*, indicate only one-half of the molecular weight, in grammes, of the alkaloid. To show the exact method employed in calculating the results recorded below, we will take the cases of belladonna root, nux vomica and ipecac root. The molecular weights of the three mydriatic alkaloids contained in belladonna root being all alike, we do not hesitate to represent it by 289. Those of the two alkaloids of nux vomica, strychnine and brucine, are respectively 334 and 394, and as we assume in this case that the two alkaloids are present in equal amounts, it follows that the molecular weight to be used in our calculations is the mean of 334 and 394, or 364. The molecular weight of emetine, the only alkaloid, at least non-volatile alkaloid, of ipecac root, is generally admitted to be 496, as the analyses made by Glenard* of the crystallized pure specimen of the hydrochloride of emetine yielded him figures which, when converted into a formula, gave $C_{30}H_{44}N_2O_4.2HCl$. We thus see that $C_{30}H_{44}N_2O_4(=496)$ or one molecule of emetine requires 2HCl to neutralize it, therefore it requires only $\frac{496}{2}$ or 248 grammes of emetine to neutralize 1HCl, *i. e.*, 36.37 grammes of HCl. Our next calculation is to determine to how much alkaloid in grammes is one cubic centimeter of our decinormal hydrochloric acid solution equivalent? We proceed as follows:

1000 c.c. of normal hydrochloric acid contain 36.37 grammes of HCl.
1 c.c. " " " " 0.03637 " "
1 c.c. of decinormal " " " 0.003637 " "

But

36.37 grammes of HCl will neutralize and are hence equivalent to..
- 364 grammes of nux vomica alkaloids.
- 248 grammes of emetine.
- 289 grammes of mydriatic alkaloids.

Hence

1000 c.c. of normal HCl are equivalent to.....
- 364 grammes of nux vomica alkaloids.
- 248 grammes of emetine.
- 289 grammes of mydriatic alkaloids.

* See Beilstein, "Handbuch der Organischen Chemie," II. edition, Vol. III., page 539; also Husemann-Hilger, "Die Pflanzenstoffe, Vol. II., page 1363.

Or

1 c.c. of decinormal HCl is equivalent to ..... { 0.0364 grammes of nux vomica alkaloids. / 0.0248 grammes of emetine. / 0.0289 grammes of mydriatic alkaloids.

In this way we know the equivalent of 1 c. c. of decinormal hydrochloric acid for every alkaloid or mixture of alkaloids, and can readily, from the number of cubic centimeters of acid used, calculate the amount of alkaloid present, and hence also the percentage of alkaloids.

The following tabular statement of results will show the relative gravimetric inaccuracies for each alkaloidal drug investigated by us in case of each method, and also the relative merits of the various methods investigated.

Fluid Extract.	Gravimetric.				Volumetric.			
	Method of Lyons.	Method of Lloyd.	Method of Beckurts.	Method of Thompson.	Method of Lyons.	Method of Lloyd.	Method of Beckurts.	Method of Thompson.
Aconite Root	0.311*	0.446	1.947	0.640	0.128	0.437	0.517	0.599
Belladonna Leaves	0.300	0.428	1.445	0.380	0.289	0.315	0.339	0.318
Belladonna Root	0.338	0.318	1.135	0.424	0.338	0.309	0.348	0.335
Bloodroot	1.232	1.560	.....	.....	†	†		
Cinchona	3.41	3.49	.....	4.70	3.21	3.20	.....	4.40
Coca Leaves	0.969	0.806	.....	0.680	0.563	0.533		
Colchicum Seed	0.682	0.600	.....	.....	†	†		
Conium Fruit	0.567	0.699	.....	.....	‡	‡		
Gelsemium	2.190	0.836	1.920	0.400	0.285	0.277	0.408	0.392
Henbane	0.265	0.306	.....	.....	0.231	0.254		
			Keller.				Keller.	
Ipecac	1.815	1.478	2.01	2.90	1.570	1.465	1.51	0.93
Jaborandi	0.443	0.884	.....	0.510	0.166	0.249	.....	0.266
			Beckurts.				Beckurts.	
Nux Vomica	1.776	1.789	3.005	1.584	1.419	1.419	1.32	1.340
Stramonium Seed	0.966	0.318	1.058	0.296	0.289	0.218	0.192	0.295
Veratrum Viride	0.832	1.030	.....	.....	0.246	0.328		

* These figures all represent the percentage of alkaloids in the fluid extract, which in every case was taken from the same bottle for all the methods. The fluid extracts were of various makes.

† Alkaloidal residues were too deeply colored to admit of being titrated.

‡ Not titrated because of the volatility of the coniine, it having been weighed as hydrochloride.

CONCLUSIONS.

The conclusions to be drawn from these results have virtually been given in the text above. Summed up briefly they are:

1. That titration with volumetric acid solution is the most reliable and trustworthy method of assaying alkaloidal drugs known to us to-day.

2. That gravimetric results as heretofore generally reported and made use of are in many cases very wide of the truth, and hence unreliable.

3. That some of the methods employed are better adapted to some drugs than to others, a perusal of the figures best showing this.

Inasmuch as several of these methods have never to our knowledge been applied to some of the fluid extracts examined, it might be of some value to mention here some of the modifications and changes made in them. The following table will, we hope, make this clear.

Fluid Extract.	Method of Lyons.	Method of Lloyd.+	Method of Thompson. △	Method of Beckurts.△△
Aconite Root ..	See Lyons Manual, §92.	Chlorof. ether.		
Bellad. Leaves..	" " § 120.	.....		
Bellad. Root ...	" " § 120.	.....		
Bloodroot	.....*	Ether alone..		
Cinchona.....	" " § 127.	Chlorof. ether.		
Coca Leaves ...	" " § 154.**	" "		
Colchicum Seed.	" " § 173.	" "⊙		
Conium Fruit ..	" " § 188.†	" " ‖		
Gelsemium	" " § 207.	" "		
Henbane	" " § 120.	.....		
Ipecac	" " § 29.	.....		
Jaborandi	" " § 120.	.....⊙⊙		
Nux Vomica ...	" " § 261.	.....		
Stramon. Seed..	" " § 120.	.....		
Veratr. Viride..	" " § 120.¶	..... ‖‖		

+ Wherever there is a dash the regular method of Prof. Lloyd using his dried soda ferric hydrate mixture and plain chloroform has been employed. The chloroform ether mixture consisted of equal parts of each.

* Evaporate F. E. Bloodroot with HCl and water to remove all the alcohol. Precipitate with ammonia and filter. Dissolve precipitate in dilute HCl and filter again. Make alkaline and extract with ether.

**A mixture of { Benzin 70 / Ether 25 } was used instead of benzin alone.

† Instead of titrating with sodium phosphomolybdate solution as given in § 188 we made alkaline with potassium carbonate and extracted with benzin and evaporated in tared beaker after adding a few drops of dilute hydrochloric acid.

¶ We used dilute acetic instead of sulphuric acid.

⊙ The chloroform ether extract was allowed to evaporate spontaneously after adding some dil. HCl. Filtered and washed with dilute HCl and extracted with ammoniated benzene-chloroform.

‖ Proceeded as under ⊙ but extracted with chloroform ether finally, making extract slightly acid by means of decinormal hydrochloric acid and heated to 100° C. weighing as coniine hydrochloride.

⊙⊙ Proceeded as under ⊙ using chloroform ether for final extracting —allowed this to evaporate spontaneously and when dry heated to 100° and weighed.

‖‖ Chloroform extract is evaporated at moderate heat on water bath; dilute acetic acid is then added and some ether to insure combination of alkaloid with acid. After evaporating the ether, filter, wash, and then make alkaline with ammonia and extract with chloroform. Evaporate at moderate heat and finally at 100 C.

△ Thompson's Method—see Proceedings of the Michigan State Pharmaceutical Association, 1891, page 67.

△△ Beckurts' Method—see Pharmaceutische Rundschau, Vol. IX., page 255 (November, 1891).

BALTIMORE, *June 28th, 1893.*

DR. ECCLES: I intended, last summer, to take up this subject that Mr. Caspari has been working upon, but circumstances prevented me. I am therefore glad that he has been devoting attention to the matter and with such good results.

MR. CASPARI: I might state, in connection with the volumetric determination of alkaloids, that Dr. Schweissinger, who is an authority in Germany on matters of this kind, prefers to titrate nux vomica with hydrochloric acid, and bases his determination entirely on the difference in saturating power of the two alkaloids, and by a process of his own reasoning ascertains the amount of strychnine present. He has verified his theory by using known weights of alkaloid and brucine and working backward; but, so far, it has not been adopted by anybody but himself.

DR. ECCLES: I have generally used two indicators in the work, and I have found that it is a good index to the molecular weight of the alkaloid. If you have the pure crystallized alkaloid of which you do not know the molecular weight, but know the quantity of acid that you use, and work in just the opposite direction, it gives an indication of the molecular weight of your alkaloid which you can afterwards correct and improve upon by merely reversing.

MR. BARTLEY: It may be of interest if I add a little of my own experience with this process. I have tried the process given in the paper, but have not had very much experience with the Brazil wood. I was uncertain as to whether Brazil wood is affected by any of the alkaloids or not. The methyl-orange is affected by most alkaloids, although there are a few—morphine, I think, is one—that are not affected by it, but it indicates the alkalinity of most alkaloids. And yet in working with that, I had very great difficulty in getting a sample that was very sensitive. Mr. Allen of England says that it is sensitive and can be used very readily, and various other analysts have mentioned methyl-orange as being sensitive to alkaloids. I found that some samples I could get were visibly sensitive to certain alkaloids, while others could not be depended upon. I believe the difficulty is in the methyl-orange itself. We are not always able to get a methyl-orange that is sufficiently sensitive. The method I have found most accurate in my own hands is this: to first dissolve the alkaloid in the acid—just as the author of the paper does—and have a little excess of acid, then with, say, a 20th normal instead of a 10th normal alkali titrate backwards. By the use of phenolphtalein I get a neutral point of light pink color.

It is then necessary to add a slight excess, then run into the burette one, two or three drops of the acid until you just discharge the pink color. Then you are through; your solution is absolutely neutral, and none of the alkaloids uncombined. You can get the commercial salts exactly neutral, so far as the acid and alkali are concerned. By the use of phenol-phtalein and $\frac{1}{20}$ normal alkali I precipitate the alkaloid. Now put in a sensitive litmus, which is affected by most of the alkaloids, and then titrate with the acid. The litmus will show a blue color with the alkaloid. By titrating with $\frac{1}{20}$ normal hydrochloric, I found it possible to get very accurate results. It is impossible to get an absolutely neutral solution by adding the phenolphtalein; and, although it is very sensitive, I found it impossible to stop at the neutral point; but by adding one or two drops of the acid before you begin to measure the acid used for taking up the alkaloid, you can get very accurate results.

MR. CASPARI: The use of phenolphtalein has been largely referred to by Professor Plugge, and he probably reported the first work in volumetric determination of alkaloids in 1886 or 1887, I think, in the Archives of Pharmacy. In the paper published he suggested the use of litmus or phenolphtalein to determine the free acid and combined acid in alkaloids, suggesting this as a method of testing the purity of alkaloidal salts, and also recommending it for alkaloids in cinchona bark. His experiments showed, in several in-

stances, that phenolphtalein was not suitable, that it was affected by those alkaloids; and, therefore, he gave a list of the alkaloids with which it might be used with safety.

The only objection I can see to Brazil wood is this, that we sometimes get it in name, but not in fact. Another thing, the authorities differ as to the reaction between Brazil wood and acid in the alkaloid. No less an authority than Professor Fresenius, of Germany, stated that Brazil wood with acids will give a peach-red color, and with an alkali, a golden yellow; and that has probably been accepted by some. I secured some Brazil wood, made a decoction of it, diluted it with alcohol, and found it was a deep purple to begin with, and could not use it at all. I sent for a number of samples of Brazil wood, the heart wood of Pernambuco. That gave us a red decoction, unaffected by the addition of alcohol, and which, when mixed with acid, assumes a bright yellow color, and with the least trace of alkali becomes a peach-red and requires but a trace of alkali to show that. I therefore adopted it in the titration of these extracts of the pharmacopœia, as directed in the titration of alkaloidal residues. The experiments made for the committee by the sub-committee on alkaloids, and also by a few gentlemen who were asked to assist the committee, have shown that Brazil wood really would give more definite and better results in the hands of the apothecary than methyl-orange, phenolphtalein, or the more delicate indicators which would require more experience in using two indicators. As the gentleman has said, Professor Allen of England speaks highly of phenolphtalein, but I think, after all, that Brazil wood is destined to be one of the best color indicators we have in alkaloidal work, and far superior to cochineal, because that has the disadvantage of also requiring more experience, while anybody can see the change from peach yellow to red in Brazil wood.

MR. BARTLEY: I am much interested to know that phenolphtalein is proved to be unreliable. It certainly is not affected by strychnine or cinchonine.

MR. CASPARI: No; they are safe. I think Allen makes the statement that in the case of a few alkaloids it cannot be used. I think it was in 1887 that Professor Plugge published his paper, and he was the first investigator who ever titrated alkaloids.

DR. ECCLES: I use phenolphtalein and litmus almost altogether.

MR. LLOYD: This paper of Mr. Caspari's is an excellent one, and only those who have been over that work can appreciate the amount of labor required to go through the many experiments. It seems to me that he is on the right track. I believe that titration, in time to come, will be the method of estimating the value of alkaloidal preparations. There is yet much work to be done in that direction. This we know, that if we can ever get a simple indicator to show when the alkaloid is saturated, rather than to test the difference between the acid and the alkali by means of a color indicator, it will be a very easy way of estimating the amount of alkaloid in any solution. That is what we want now.

MR. BARTLEY: I may add that I went through a long series of experiments to test the method, with as pure a quinine as I could obtain by taking the purest commercial article I could buy, then recrystallizing and thoroughly drying it. I next attempted to estimate the acid, and found that this was not reliable, that these commercial salts were not always definite chemical compounds. In other words, I did not get the same results when I titrated the acid and alkaloid and pure quinine sulphate. I found, in most cases, a little basic reaction; that is, by taking a more sensitive indicator and dissolving the purest quinine sulphate recrystallized, I almost always found after drying at 100° to get rid of water, that it had a basic reaction, so that titration on either side did not give the same results, but I got exactly the theoretical results every time by the above method.

THE CHAIRMAN: I do not think Mr. Lloyd raised the question of purity. It has been a question, with me, whether the alkaloids, as we get them, are found in the same condition in plant life. I doubt it very much. I believe that the menstrua that are used, no matter what they are, alcohol, ether or chloroform, have some effect on the principle which is contained in the plant. I argue from the standpoint that as there are products in the human body formed through micro-organisms in which, under certain conditions, we find certain changes, similar changes probably take place in plant-life, and consequently form products which are found at different times, in different proportions and of different constitutions, and I think that in a measure this accounts for a great many varieties that we find in the percentage of strength and also in identification. I think that is the point Mr. Lloyd wished to raise.

MR. LLOYD: While I believe this titration method is the method of the future, I may also state that I do not believe the apothecary, at the present time, is ready for it. I believe that the apothecary would prefer to work with a method in which he can use the balance, and that it will require the education of the college and university to familiarize those who go out from our institutions with these titration methods. My experience with the druggist tells me that he does not want it just now, but prefers to use the balance.

MR. HALLBERG: I am of exactly the same opinion as Mr. Lloyd. I do not like to make a statement that I cannot support with facts; but I am satisfied that most of these substances that we call alkaloids exist in the plants in the form of acids. I am quite confident of that, although I am not able to prove it. Some of them are volatile acids. I had, in fact, an experience in connection with this matter not long ago. I undertook to remove the alcohol from a drug, as I have done before, by placing it in a still and pouring some water on it. The alcohol was quickly recovered and condensed, simply with some water; but some of the water, at the conclusion of the process, came over, and it had an acid principle in solution. When the liquid was condensed, it gave a decided taste and odor and acid reaction. In former years, I have had frequent experiences of this kind; and, although I have never been able to follow up the subject, I consider it a very important direction for the worker. I believe that this treatment with alkalis, in order to produce alkaloids, is very frequently the operating force, and that, originally, the substance is contained in the form of an acid in the plant.

DR. ECCLES: Am I to understand, Mr. Hallberg, that the condition of the alkaloid is an inorganic acid, as it is contained in the plant, or is it really a salt of some organic acid with which it is united and separated from by action of the alkali?

MR. HALLBERG: No; I suppose they are all considered to be the alkaloids in combination with acids; that is the theory now generally accepted with reference to it, I believe.

DR. ECCLES: If that were the case, then the addition of the alkali should form a salt of the acid as it exists, theoretically, according to Mr. Hallberg's statement, and we ought to be able to separate an acid into this alkaloid that we cannot afterwards be capable of breaking down. Now, nobody has ever accomplished this, so that the fact is against the theory.

MR. CASPARI: I do not wish to oppose Mr. Hallberg's theory, but I certainly think it is rather a novel theory that we should obtain an alkaloid from a drug which is capable of yielding only what we call a volatile acid. I would like to know by what state of transformation that volatile acid, as he calls it, passes through the condenser as an alkaloid or alkali into the receiver. That is incompatible with my limited knowledge.

MR. HALLBERG: I do not mean to say that this statement would be true in any

number of cases, but I am convinced, in my own mind, that there are such instances. As an excuse for making the statement, I would say that this subject is merely one of speculation, and for that reason I think I am entitled to throw out the suggestion.

MR. CASPARI: I think it is well that we should express our views and theories at all times; and probably Mr. Hallberg's theory will upset all the present theories and facts. If so, I would congratulate him on the new discovery; but I am not quite ready to do so just yet. I believe with Mr. Lloyd that the apothecary is not yet ready, in this country, to adopt titration entirely. I am aware of the fact, but I think if work in this direction is carried on continually, it will help the apothecary to reach that condition where he can apply it intelligently. It is remarkable how closely we can approach accurate results by the use of volumetric solutions. The gentleman from Brooklyn (Mr. Bartley) stated, a few moments ago, that he was able to obtain, within a few milligrammes of the quantity used. It may be interesting to him to note a few figures showing how near we have been able to come to the amount used.

The following paper, in the absence of the author, was read by Mr. Morrison of Montreal:

CANADIAN POTASH.*

BY T. D. REED, M. D., PROFESSOR OF MATERIA MEDICA, MONTREAL COLLEGE OF PHARMACY.

The manufacture of "Pots" and "Pearls" in Canada has greatly fallen off in recent years. The competition of the mineral or German chloride has much debased the price, thus rendering the manufacture from wood ashes little profitable. The consumption of unleached ashes for agricultural purposes has also had its effect.

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*A NOTE ON CANADIAN POTASH.—*By J. E. Morrison, Chemist, Montreal:* While in Quebec a few days ago, I called upon Mr. Despatie, the manufacturer of potash mentioned by Dr. Reed, for the purpose of taking a photograph of his establishment to accompany Dr. Reed's article, and also for the purpose of obtaining a few more ideas on the subject. As regards the proportion of potash obtained, the yield is generally 600 lbs. from 100 bushels of ashes weighing from 50 to 60 lbs., and very rarely as high as 75 lbs. per bushel. He finds also that wood coming from the lower ports on the St. Lawrence always contains a comparatively large per centage of salt, and white birch contains more than any other, apparently due to the vicinity of a large body of salt water; so that with the supply of ashes obtainable in Quebec it is very difficult to turn out a potash, answering the requirements of "first sorts," as regards saline matter. He has also found that green wood yields a larger proportion of potash than perfectly dry wood.

The best woods for potash-making purposes are ash and elm, and the next maple. Ash and elm do not grow very plentifully, and are seldom used for firewood in the Province of Quebec; but maple and birch are very plentiful, and consequently the most of the potash is produced from these woods.

I at first thought that an inquiry into the potash-producing power of the different woods would be a good line of investigation, but I find that the subject has already been thoroughly gone into by Vauquelin, Kirwan and De Saussure a great many years ago; but I think that an investigation of the statement that the wood from the vicinity of salt water contains more chloride than from fresh water, might be of interest to the profession, as I can find nothing bearing on it in the literature accessible to me at present. I hope to begin work on the subject shortly, and will report at the next convention, if it should prove of sufficient interest.

Potash is still, however, an important article of export, as is illustrated by the fact that nearly two millions of pounds weight of "pots" and "pearls" (1,800,000 lbs.) passed under observation in the Government inspection office at Montreal in 1891, and a million and a half (1,409,200) in 1892. The records of the inspection office extend over half a century, and during that time the year of greatest out-put was 1850, when twenty-seven millions of pounds were exported.

It is stated in Roscoe & Schorlemmer that at the time of the Vienna Exposition the record of the world's production of potash alkali from wood ashes for 1870 was 20,000,000 kilos. If these figures are correct, Canadian potash accounted for one-fourth—10,000,000 lbs.

The writer paid a visit recently to one of the oldest factories in the province, situated in St. Sauveur, a suburb of Quebec. Here potash has been made for over thirty years. A light wood building is divided into two compartments; in one the year's stock of wood ashes, collected in the winter, is stored; the other contains the percolators and furnace. The percolators are wooden cylindrical vessels, like immense hogsheads. The furnace is built of stone, and contains imbedded in it, three potash "kettles." These are hemispherical pots of cast iron, thirty-seven inches in diameter. These are arranged in line from the front to the back, so as to utilize the heat before its disappearance up the chimney. Nos. 1 and 2 are used for evaporating and melting, and No. 3 for heating water for the percolators.

The process for exhausting the ashes is a repercolation; the lye from the first vat is poured into the second and so on until strong. The liquid poured on top passes through the ashes and then through a layer of slaked lime, on a shelf near the bottom. The fuel was very dry, soft wood, making a fierce blaze.

Two kettles of fused potash were made in four days without working at night. The complete evaporation of the water is manifested by the appearance of the seething contents of the kettle changing to that of a quiet, oily liquid, which soon become red hot. This is now ladled into iron moulds to form cakes of about 325 pounds. Two cakes make the contents of a cask. The casks are of hard wood, generally oak, the legal size being 32x22 inches. Two pounds of dry lime per cask is allowed as a preservative dusting powder.

In a good sample, on breaking the cake, a grey appearance, slightly pink, is seen with a heart of different colors, as white, pink, blue, etc.

For inspection, from a fresh fracture, a portion is broken off and one hundred grains dissolved to be titrated with standard acid for its proportion of alkali estimated as KHO. As there is always some carbonic acid gas evolved, methyl-orange becomes desirable as an indicator. Seventy per cent. and upwards, if free from the suspicion of salt, leads to the brand of "first sorts."

During the last two years the range has been from 36 per cent. to 84 per cent. Prof. Lloyd, in an important paper presented to this Association at its last annual gathering, reported a sample of American potash testing 91.28 per cent. This is astonishing, as it is stronger than the limit of the U. S. P. or B. P. for fine white stick potash, and much better than the samples reported on by Messrs. Gœbel & Patch in 1885. The writer has not met with any stronger than 84 per cent. In addition to real potash, chlorine is especially estimated, as the presence of salt is injurious in soft soap manufacture and other processes. The chlorine is readily found by means of a volumetric solution of silver nitrate with potassium chromate to indicate the completion of its precipitation.

In the products of one manufacturer, whose works were inspected, and in whose "*bona-fides*" confidence was placed, 6 per cent. has been found. As much as 20 per cent. has been met with. In this case adulteration may well be assumed. The workmen handling the potash acquire wonderful skill, by observation alone, and pronounce on the quality with general accuracy without any knowledge of chemistry.

Caustic soda being a possible adulterant, some samples were submitted to Prof. Ruttan, of the chemical department of McGill College, for thorough analysis; they were in every case pronounced free from added sodium. The following are some analyses made at McGill of very good and very poor Canadian potashes:

KOH	70.210	53.24	63.06
K_2CO_3	9.194	7.66	22.55
NaCl	1.46	12.90	1.02
K_2SO_4	2.31	11.41	3.73
Insoluble	1.385	1.22	3 899

In the manufacture of pearlash, the lye, without lime is evaporated to a condition of black salts, then burnt on the hearth, redissolved, syphoned off bright, evaporated and again burnt, a beautiful granular product with a bluish tint being obtained. This manufacture is in very few hands in Canada; 165,000 lbs. passed through the Montreal office in 1892. It was almost uniformly of excellent quality, averaging over 90 per cent. pure.

The difficulty of obtaining good potash and pearlash in the United States, suggested by the tone of Prof. Lloyd's paper, would be met by applying to Montreal, if the Customs rate be not a bar financially. The purchaser of "pots" and "pearls" with the Canadian brand "first sorts," may rely on a good article; the inspection is real, every lot being subjected to chemical tests under the direction of a sworn Government officer.

The leached ashes are found to be very valuable in agriculture, probably on account of the unextracted phosphate, and the sale of this, helps in a way to make commercially possible, the manufacture of potash at the low prices now ruling.

With cheap potash it would seem that a combination with Carolina fossil phosphates could be made which would be very precious for agricultural purposes, returning to mother earth some of the most valuable elements of crop stimulation.

The market quotations in Montreal at present would be, first pots about 4½ c.; first pearls about 5½ c.

For permission to use the figures and facts on which this paper is based, I am indebted to the kindness of E. J. Major, Esq., Ashes Inspector at Montreal.

91 University Street, Montreal, August 10, 1893.

MR. LLOYD: In regard to this subject of potash, I would call attention to the fact that the ashes of corn-cobs, as is well known, contain about 33⅓ per cent. potash. A few years ago, I proposed to see if I could not use these ashes for making potash in the works with which I am connected, but I found that twenty pounds of corn cobs would only yield me about two ounces and-a-half of ashes. I found, furthermore, that in the western States where they burn corn-cobs for the purpose of shelling the corn, that they use so much coal with the cobs that I could not get the ashes pure enough to use.

Concerning the quality of the Canadian potash, I would say that the industry is vanishing from the United States, and it will not be many years before we who have to use common potash, where in some instances we cannot use the German potash, will have to look to Canada for our potash. An endeavor was made a few years ago, when potash became a little scarce in our section, to get some Montreal potash, not successfully, however, as compared with the price of that obtainable in the United States.

It is my duty to assay a car-load of potash a month. In the works with which I am connected we use half a million pounds a year. For a short time only it was found that the people from whom we purchased would not have a potash that was below a certain standard, and I was forced to throw out a lot that was sent to us. During the past year, however, I have found not a car-load that would run below 70 per cent. and nearly every car-load has been quoted at 75 per cent. At present, I find it necessary to take only ten casks out of the car-load and select it approximately. I accept the car-load on the assay of these casks. I endeavor to get a sample from three or four different parts of the cask, and these samples are mixed together, and then titrated and assayed. By a very simple process, manufacturers of potash can make potash conform to the test of 75 per cent. if they want to do so. In making soap in this country, the manufacturers want potash as free from carbonate as possible, and a potash made in which the lye is run through as large a quantity of lime as possible. Otherwise, they have to use lime in making their soap. In the industry with which I am connected, however, it is of little consequence, and we would as soon have a carbonate, as a potash, but I object to the mixing of lime in large quantities with the potash sold as potash. There is a little excuse for the mixing of lime with the potash; there is none for the mixing of salt with it, when the quality of the potash has been decreased or run down by common salt and lime to 25 per cent. potash, in a cask. This, however, as I have intimated, has nearly disappeared in our section, and we have no trouble in getting potash that conforms to the test.

THE CHAIRMAN: If I am not mistaken, the strength for all manufacturers by assay is based on a certain Liverpool test by which they increase the figures from two to seven per cent.

MR. LLOYD: There is no American test for American potash. So far as the United States is concerned, there is no test that I can find to apply to the salts to establish a

value. They estimate by the appearance of the cask and the amount of lime or other impurities, and class it as "first and second sorts," but that which I have sometimes obtained as "first sorts" has been inferior to that sold as "second," and consequently as inferior potash. In that which we purchase from Germany the carbonates give us a more exact test, and will run to 97 or 98 per cent. as it is estimated. That is used in our section, and it is found advisable to mix a certain amount of German carbonate, in some instances, with the potash.

THE CHAIRMAN: The reason why I asked the question is this: A few weeks ago some litigation took place between a manufacturer and purchaser of potash. He presented the results obtained by his chemist, and the manufacturer refused to accept it. The matter was finally referred to the Chamber of Commerce—where the question was to be decided—and the Chamber of Commerce decided against the purchaser, on the ground that he was buying on the principles of trade established in America, and ignored the system adopted in England for potash, namely, the so-called Liverpool test.

MR. MORRISON: It may be of interest to add that the present price with us is from 4½ to 5 cents per pound. In regard to the test there, I may say that I know nothing about the Liverpool test; but the only test that they have there is administered by a government officer who attends to the work, who has to attend to the testing of each lot that comes in, and a barrel branded as "First Sorts" contains at least 70 per cent. of potassium hydrate and not more than 2 per cent. of chloride. And then, furthermore, as regards the legal safeguard thrown around the purchaser of potash, it may be stated that the size of the cask even is arranged by law, and there is a very heavy penalty for improperly using the brand "first sorts." No one is allowed to put that brand on a cask but the government inspector; and a government inspector who would brand ja cask "first sorts" unless it actually complied with the law would be severely punished both by a fine and the loss of his position.

As to the sample of potash, you will notice the dryness of it, and to some members it may be of interest to learn how it was preserved. Knowing the caustic nature of potash, and wishing to bring a good sample here and keep it in good condition, I put about an ounce of strong ether in the bottle, and then when the potash was ready, took out the ether and put in the caustic potash, sealed the cork up with wax, covered the cap with gelatine above, and closed down so as to guarantee that it would be absolutely air-tight, and it has kept in excellent condition.

THE CHAIRMAN: The Canadian law fixes a minimum and not a maximum amount of potassium hydrate?

MR. MORRISON: Yes; 70 per cent.

MRS. MINER: I would ask whether Mr. Lloyd has not solved the problem of preventing adulteration. In speaking of assaying the casks of potash and finding it at first very much below the requirements, I understood him to say that after repeated investigations he found eventually less cause for complaint. Would it not be well, in testing chemicals, or galenicals, or fluid extracts, whenever we find that we have on hand something that is not fully up to standard, to always return it to the source of supply? By doing this would we not be enabled in time to prevent adulteration or the sale of inferior articles?

MR. LLOYD: Replying to that, I would say that very often those who furnished this potash to us were perfectly honest, and I was always very careful to write them to the effect that it was below standard, and they thanked me for it. It was not made conspicuous. They took it back and the quality gradually improved. The potash we get in this country often comes from people who have taken it from those who make it in small

quantities, and it was thrown back on their hands. I presume they have now learned that in order to sell their potash they will have to make it conform to the standard, and have learned to do so. It was all very quietly done, but thoroughly accomplished, that is, the throwing back of this poor potash on the hands of those who were putting it on the market, and they have since learned how to make it good. I think that most people can be educated in that manner.

Mrs. Miner: That was the point exactly, and it has been my idea of preventing the adulteration of substances.

Dr. Eccles: My experience in sending goods back to manufacturers has not been so satisfactory as this. Instead of thanking me for it, they have intimated that I made a blunder and they were in the right. There is a house in Philadelphia that has now declared, four times in succession, that their goods were fully up to standard, and that if I did not accept them the goods could not be had anywhere else. The last experience I had with them was in reference to hydrocyanic acid that was less than ½ of one per cent., and they declared that there was no better hydrocyanic acid in the United States, and a better could not be obtained. The house supplying it, and buying it from the Philadelphia house, sent me their letter, and I sent word back that I could find a better acid if they could not, and I would not take any other than the kind I wanted. I get only the right kind.

The following paper was read by title only:

CHANGE OF VOLUME WHEN LIQUIDS OF DIFFERENT DENSITIES ARE MIXED.

WILBUR S. SCOVILLE.

From time to time articles appear in our text-books, journals and proceedings, offering a rule whereby liquids of different densities may be mixed to obtain any desired intermediate density. These rules are necessarily limited to those liquids which neither contract nor expand when mixed, but the fact has apparently been overlooked that such liquids are rare rather than common.

It has been known for some time that solutions of salts contract when diluted, or in other words, if an aqueous solution of a salt be diluted with water, the volume of the mixture is generally less than the sum of the volumes used in producing it. The same is generally true of indifferent liquids, though in a few cases expansion occurs rather than contraction, and in some no change in volume can be observed.

At the same time that this change in volume occurs, a slight change in temperature also takes place. There is commonly an elevation of temperature, but sometimes a lowering occurs, and in many cases no change in temperature is observed. This change in temperature bears no relation to the change in volume, since contraction may be accompanied by either an elevation or lowering of temperature, or with no change in temperature, and likewise an expansion in volume may be accompanied by a change in temperature in either direction, or with none at all.

In the present paper no attempt has been made to measure the changes in temperature, the object being only to call attention to the changes in

volume which occur, to show how nearly universal this change is, and to demonstrate that it is of sufficient extent to render void the use of specific gravity rules, in most cases, for anything except approximate results.

FIG. 7.

Apparatus for measuring contractions.

To illustrate, a mixture of glycerin and water in the proportions and quantities used in the table appended, contracts 2.0 c.c., which may be taken as a mean of the contractions. The calculated gravity of such a

mixture, provided no contraction takes place, would be 1.1369 (approx.), [89 c.c. × 1.2554 = 111.73 G. + 77 = 188.73 ÷ 166 = 1.1369].

But the contraction changes the quantity to 1.1508 (approximate), (188.73 ÷ 164 = 1.15079), a difference of two in the second decimal, which is verified by trial.

The apparatus by which the contractions were measured consisted of a double bulb of glass, the lower of which bulbs was extended into a tube 15 cm. long, graduated to hold 10 c.c. in $\frac{1}{10}$ c.c. 0.05 c. c. could be read easily in this tube.

The upper bulb was fitted with an accurately ground stopper, the two bulbs connecting at opposite sides.

In using it, the lower tube and bulb was completely filled with the heavier liquid at 20° C., by means of a long-stem funnel, then the lighter liquid flowed into the upper bulb, which was filled to the brim, so that insertion of the stopper displaced a part of this liquid, and no air space was left in the apparatus.

The liquids were then mixed by inverting the apparatus and shaking, placed in a water-bath kept at 20° C. until this temperature was uniform in the apparatus, then the contractions read upon the graduated tube.

The lower bulb and tube held 89 c.c., the upper bulb 77 c.c.

It was better for appearance sake to have used an apparatus holding equal volumes of each liquid; but as the only object was to show that there is a change of volume in most cases, and as an accurate table showing the extent of such change would be of little or no practical value, no attempt was made to construct such a table.

The common solvents and most soluble salts used in pharmacy were selected for experimentation, the salts being used in aqueous solution, nearly saturated. Gravities were all taken at 15° C.; the liquids mixed and contractions read at 20° C.

The results are given in the following table:

Heavier Liquid.	Spec. Grav.	Lighter Liquid.	Spec. Grav.	Contraction.
Acid, Acetic Glacial	1.0615	Water	1.0000	5 c.c.
Acid, Citric	1.2620	"	1.0000	0.5 c.c.
Acid, Hydrobromic	1.2364	"	1.0000	None.
Acid, Hydrochloric	1.1754	"	1.0000	0.75 c.c.
Acid, Nitric	1.4210	"	1.0000	6.45 c.c.
Acid, Tartaric	1.3205	"	1.0000	0.8 c.c.
Alcohol	.8199	Ether	.7279	1.85 c.c.
Alum	1.0515	Water	1.0000	Very slight.
Ammonia Water	.8977	"	1.0000	None.
Ammonium Chloride	1.0765	"	1.0000	0.35 c.c.
Calcium Chloride	1.3070	"	1.0000	1.2 c.c.
Carbon Bisulphide	1.2711	Benzine	.6975	None.
Carbon Bisulphide	1.2711	Cotton Seed Oil	.9329	None.
Chloroform	1.4896	Ether	.7279	2.1 c.c.
Chloroform	1.4896	Oil Turpentine.	.8751	Slight expansion.
Chloral	1.3615	Water	1.0000	0.6 c.c.
Copper Sulphate	1.2077	"	1.0000	0.5 c.c.
Glycerin	1.2554	"	1.0000	2.0 c.c.
Iron Sulphate	1.2405	"	1.0000	0.6 c.c.
Magnesia Sulphate	1.2862	"	1.0000	1.2 c.c.
Oil Turpentine	.8751	Ether	.7279	0.5 c.c.
Potass. Bicarbonate	1.1587	Water	1.0000	0.45 c.c.
Potass. Bromide	1.3557	"	1.0000	0.55 c.c.
Potass. Carbonate	1.4282	"	1.0000	2.55 c.c.
Potass. Iodide.	1.6440	"	1.0000	0.55 c.c.
Potass. Nitrate.	1.1377	"	1.0000	0.25 c.c.
Sodium Carbonate	1.2281	"	1.0000	1.15 c.c.
Sodium Chloride	1.2052	"	1.0000	0.7 c.c.
Sodium Salicylate	1.1942	"	1.0000	0.7 c.c.
Sodium Sulphate	1.1198	"	1.0000	0.3 c.c.
Soda (caustic)	1.4 67	"	1.0000	6.8 c.c.
Syrup	1.3462	"	1.0000	0.45 c.c.
Zinc Sulphate	1.4717	"	1.0000	1.7 c.c.
Water	1.0000	Alcohol	.8199	4.65 c.c.

MR. CASPARI: Without hearing this paper, I would say that I had some friendly discussions with Mr. Scoville and also with Mr. Patch in regard to this matter of the possible contraction taking place when glycerin is mixed with water, they both contending that a very material reduction would take place in volume, and hence the rule they had given for the mixture of glycerin and water, in certain proportions would hold. This is the point all take. I had suggested that the proportions in which they sought to mix glycerin and water to produce a certain specific gravity, were not correct, based on some experiments I had made. I presume this work has been done very carefully, however, for in Massachusetts they generally do work thoroughly. In making these experiments two years ago, for my classes, I found no appreciable contraction when mixing, in a graduated cylinder, known volumes of glycerin and distilled water, the specific gravity of the glycerin having been tried very carefully and then mixtures made to determine the quantities necessary to produce liquids of certain density. It was in connection with some work in regard to adjustment of specific gravity in liquids. In the last Pharmacopœia and in the forthcoming one the pharmacist frequently finds himself in the unfortunate position of having calls for liquids of certain densities when he has liquids of greater density, and it is difficult to know how much water to mix with these to produce the desired specific gravity. I was called upon by a wholesale house, once, to suggest how much glycerin and water should be mixed to obtain a certain specific gravity, as they did not know how to do it.

THE CHAIRMAN: I did some work in the same direction after Mr. Caspari called my

attention to it, and simply worked with glycerin and water at a temperature of 22° Celsius. This paper takes the specific gravity at 15° and reduces at a temperature of 20° Celsius, and finds in the proportion of 77 to 89 cubic centimetres that the contraction of glycerin having a specific gravity of 1.25 and a fraction, etc., gives a contraction of 2 cubic centimetres. I have never been able to find any contraction in which I did not work with these volumes, namely, 77 to 89.

MR. CASPARI: I believe this graduated tube attached to this apparatus is very delicately graduated. I believe it can register one-tenth of a cubic centimetre.

Mr. Fennel read the following paper:

THE VALUE OF THE PHARMACOPŒIAL REQUIREMENTS FOR OIL OF CLOVES.

CHAS. T. P. FENNEL, PH. G., PHAR. D.

According to the Pharmacopœia we expect to find oil of cloves to be a pale yellow, thin liquid, becoming darker and thicker by age and exposure to air; having a strongly aromatic odor of cloves, a pungent and spicy taste, and a slightly acid reaction.

Specific gravity about 1.050. It is very soluble in alcohol. With an equal volume of a concentrated solution of potassa, it forms a semi-solid mass.

The above description of the characteristics of oil of cloves will fit, with but slight modifications, the requirements of every volatile oil of the Pharmacopœia, and this generalization must necessarily fail to give that protection to the pharmacist intended by the specific description of each individual oil. The French Codex and the British Pharmacopœia are no more specific, in fact much less so than the U. S. P., and consequently likewise fail to accomplish the object intended by specialization.

The German Pharmacopœia is far more specific in defining the characteristics of the oil, and yet the writer found all the essentials of a pure oil, with the exception of one, in the adulterated article based upon the requirements of this Pharmacopœia.

According to this authority, oil of cloves may vary in color from yellow to brown, possess a sharp aromatic odor and taste; boiling at 247° C.

Specific gravity at least 1.060.

Additional requirements for identity and purity are given as follows:

1. Five (5) drops of oil thoroughly shaken with 10 c.c. of lime water, produce a flaky precipitate adhering partly to the side of the vessel.

2. Two (2) drops of oil dissolved in 4 c.c. alcohol, are colored green by one drop of solution ferric chloride.

3. One (1) drop of a diluted solution (1–20) of ferric chloride produces a blue color, readily changing into red and finally into yellow.

4. One cubic centimeter of oil shaken with 20 c.c. of hot water, must show only the faintest tint of acidity with litmus paper.

5. The cooled filtrate of the above, perfectly clear, must not react with blue color with solution of ferric chloride.

6. One part of oil and two parts of dilute alcohol, must mix perfectly clear.

The specifications cited are only reliable for the detection of gross adulterations, for the following reasons:

1. Color cannot be considered a criterion for purity, which applies with equal force to odor and taste, on account of variations depending upon age and exposure to atmosphere.

2. Specific gravity has always been considered a very important factor, since admixture of turpentine would lower the specific gravity, but the misapplied ingenuity of man has overcome former obstacles and rendered this factor unreliable.

3. The precipitation of eugenol, or eugenic acid, by lime water is no safeguard against adulteration, since requirements for identification and quantity are not given.

4. The coloration of alcoholic solution by solution of ferric chloride is characteristic of eugenol, but, under certain conditions, the same color reactions may be produced by carbolic acid and salicylic acid. The intensity of color and apparent shades of color are dependent upon concentration, and, therefore, a variable factor.

5. Acidity is likewise no criterion for purity, since slight acidity is permissible, and quantity of free acid being dependent upon age, and more probably upon exposure to air.

6. Saturated aqueous filtered solution must not give characteristic blue reaction of eugenol, owing to its non-solubility in water—its indication in aqueous solution being supposedly due to carbolic acid.

This test can likewise not be considered a factor for purity, since eugenol is apparently slightly soluble in water, especially if the latter is not recently distilled. The slightest trace of alkali greatly increases the intensity of color.

7. Solubility of the oil in diluted alcohol (1–2) was considered an important factor for purity, since the slightest turbidity would indicate admixtures of turpentine or paraffin oils.

Generally, this test is applicable, but its trustworthiness is vitiated by castor oil, and therefore the test can no longer be considered reliable.

8. The only remaining test is that of the boiling point, and this one, owing to the apparent difficulty in its application, is usually ignored; yet the boiling point is the safest criterion for purity. The writer has examined quite a number of specimens of oil that met all the cited requirements for purity excepting the boiling point, and which would on this basis be considered pure, yet were found to be grossly adulterated.

The accurate determination of the purity of any volatile oil is exceedingly difficult and often impossible, and, therefore, approximation to the truth can only be established.

The quantitative estimation of admixtures such as alcohol, chloroform,

turpentine and fixed oils, owing to their presence in small percentages, is extremely tedious and, at best, very unsatisfactory, the percentage results varying with the quantities of the original mixture under operation, each element of admixture being influenced and affecting the physical characteristics of the additions. The presence of a small percentage of water, whether added intentionally or produced by decomposition under atmospheric influences, materially lowers the boiling point and interferes with separation by fractional distillation. The methods employed have stood their test for accuracy, and have not been found wanting in reliability, but deficient in their adaptability to the wants of the pharmacist. Approximation to the truth is all that can be desired, and this can be established by the Pharmacopœia by fixing a definite range of low and high boiling points for every volatile oil, fortified by the percentage of main constituent obtained by a specific method. To substantiate these remarks the writer desires to call attention to the examination of four specimens of oil of cloves, obtained from reliable sources and supposed to be pure.

Submitted to the tests of the United States Pharmacopœia and those additional tests cited by the German Pharmacopœia, (excepting the determination of the boiling point,) the oils were found to meet the requirements of identity and purity.

Specific gravity at 15° C. ranging from 1.052 to 1.055.

Boiling point 135° C., without correction for barometric pressure.

The oils were submitted to fractional distillation and the fractions examined.

Distillation commenced between 80° C. and 82° C., and was interrupted at 102° C., resulting in 16 per cent.

Rapid increase in temperature, complete ebullition at 135° C., gradual increase to 150° C., when temperature remained stationary, obtaining 34 per cent.

Gradual increase in temperature to 226° C., remaining constant at that temperature and obtaining 30 per cent.

Temperature commenced to drop, distillation interrupted. Residue, 20 per cent.

Examination of the Distillates.

1. Fraction obtained between 80° C. and 102° C. = 16 per cent.
   Specific gravity 0.823 at 15° C.
   Odor and taste of cloves, perfectly clear and colorless.
   Slightly acid.
2. Fraction obtained between 102° C. and 150° C. = 34 per cent.
   Specific gravity, 0.875 at 15° C.
   Odor and taste of cloves, perfectly clear and colorless.
   Neutral reaction.
   Burnt with a smoky luminous flame and reacted with violence with iodine.

3. Fraction obtained between 150° C. and 226° C. = 30 per cent.
Specific gravity, 1.036 at 15° C.
Strong odor and taste of cloves.
Perfectly clear, yellow-brown in color.
Oily in consistence.

Residue: Thick viscid liquid, having the odor of cloves, very pungent yet acrid to the taste, completely soluble in alcohol in equal proportion.

Second Fractional Distillation.

The first fraction was submitted to a second fractional distillation, with the following result:

Distillate up to 92° C.=4 per cent. perfectly clear and colorless, odor and taste of cloves, burning with a non-luminous flame, slightly acid in reaction. The quantity too small to determine specific gravity.

Distillate at 92° C. becoming milky, continuing to be so up to 94° C.= 1.6 per cent.; becoming clear by the addition of the subsequent distillate at 102° C., leaving no residue excepting an oily coating to the distilling flask. The quantity too small to determine specific gravity. Neutral solution of ferric chloride (1–20) gave a bluish-green coloration.

Fraction obtained between 102° C. and 150° C., submitted to a second distillation, apparently remained constant, leaving but a slight residue, oily in nature. Specific gravity, 0.879 at 15° C.

Fraction obtained between 150° C. and 226° C. showed marked difference in color, becoming much darker and leaving a dark and tenacious residue.

Specific gravity, 1.045 at 15° C.

Color reaction in every distillate being unsatisfactory, blue, bluish-green and green, according to the presentation to light.

Original residue from distillation was saponified in alcoholic solution with sodium carbonate and boiled to remove alcohol; neutralized, result indicating fatty oil and resin.

The fatty oil completely soluble in alcohol, burning with a very disagreeable odor.

The percentage of eugenol was obtained from the original oil by shaking with a dilute solution of potassium hydrate (1–10), filtered, expressed by pressure with bibulous paper, and the eugenol separated from the solid mass by dilute hydrochloric acid, washed with water, and, rectified, indicating 48 per cent.

Specific gravity, 1.045 at 15° C. Boiling at 232° C.

Reviewing the results we find that the oil in question meets the pharmacopœial requirements, and yet is far from a pure article. The many sources for eugenol and closely allied products, and the difficulties encountered in their differentiation, offer an incentive for sophistication. We find on the market offers for an impure eugenol, said to contain 95

per cent. eugenol, and obtained as a by-product in the manufacture of safrol. This is in all probability obtained from the leaves (Illicium religiosum) of star anise, and used as the basis for the commercial oil of cloves.

MR. EBERT: Many years ago I was acquainted with a man who made a living by adulterating essential oils. He had the knack of doing it by using castor oil and alcohol, and always getting the specific gravity of the pure oil to a nicety. He was an expert. Castor oil and alcohol were the two adulterants employed in all the essential oils that he manipulated. Of course, that is an old trick, but it is nevertheless interesting.

MR. FENNEL: The identification of castor oil is rather a difficult matter. I have not been able to identify it positively.

DR. ECCLES: Did you determine the refractive index ?

MR. FENNEL: No; I have not done so. I may say, however, that a great deal of information on this subject will be found in the next paper that is to be presented to the Section.

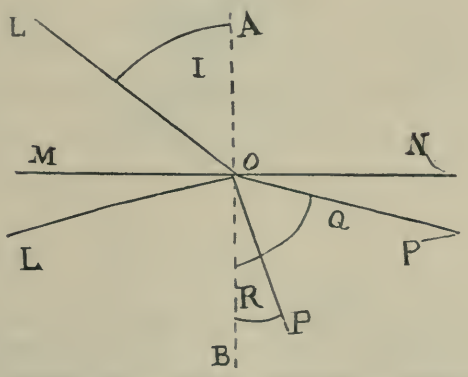
The following paper was read :

REFRACTOMETERS AND THEIR USES.

BY W. F. EDWARDS.

Since the discovery of the law of sines connecting the directions of a ray of monochromatic light in passing from one medium into another the refraction of light has been a subject of ever increasing interest and ever expanding application. To-day we find it of great importance to the physicist in the study of light, to the scientific chemist in the study of molecular refraction and molecular dispersion, to the optician in designing the most desirable optical instruments, to the mineralogist and geologist in the study

FIG. 8.



of minerals and rocks, to the astronomer in the study of planets, stars and nebulæ, to the analytical chemist in qualitative and quantitative determinations of many substances, etc., etc.

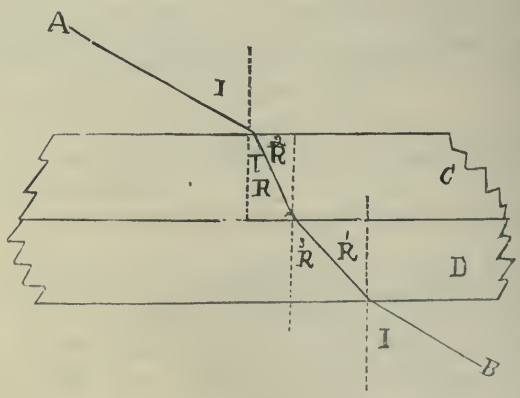
Within the last thirty-five years a considerable number of instruments have been designed for determining the coefficient or index of refraction, but I shall confine myself in this paper to a description of a few instruments especially useful to the analytical chemist, making very brief mention of some instruments similar in general construction.

For clearness allow me to call attention to the law of sines. Let MN, Fig. 8, represent a linear element of the plane of separation of two transparent media, A and B, the plane being perpendicular to the plane of the paper, LOP be a ray of light in plane of the paper, and moving from the less refracting medium, A, into the more refracting medium, B, and AB be a normal to MN at O. Then angle I is the angle of incidence and angle R is the angle of refraction, and we have $\sin I / \sin R = m$ = index of refraction for A and B: m is a constant for any two media, whatever direction LO may have in A. If we consider the ray as going from B into A, it will take the same path from P to L that it took from L to P, and we have $\sin R / \sin I = I / m$; or in both cases $m \sin R = \sin I$. Angle I is always greater than angle R, and for light passing from B into A a ray, say P O, may be taken that will make angle I have its limiting value, 90 degrees, and we would have $m \sin \phi = 1$.

The angle ϕ is known as the critical angle, and light going from B into A and incident at this angle or any greater angle is almost totally reflected back into B according to the ordinary law of reflection.

If we can determine this critical angle we have a means of determining

Fig. 9.

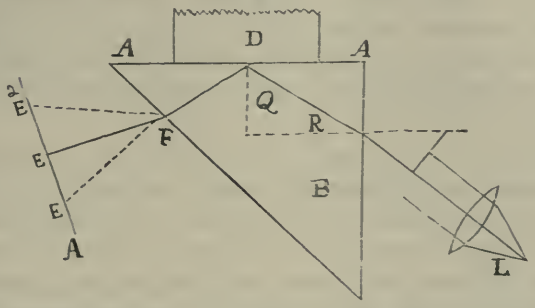


the index of refraction. This can be done by observing when the light passing into A becomes a minimum, or when that reflected back into B becomes a maximum. The first method is represented in Prof. Abbe's instrument, and the second method is represented in Dr. Pulfrich's refractometer for chemists.

In order to better understand these instruments, let us consider a

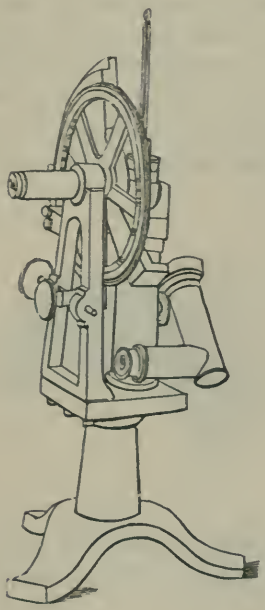
ray of light in passing through two media bounded with parallel faces, and the faces of the one parallel to the faces of the other, as shown in Fig. 9,

FIG. 10.



where $\sin i / \sin r = m_1$, the index of refraction for a ray from air into C: $\sin i_1 / \sin r_1 = m_2$, the index of refraction for a ray from air into D; $i = i_1$, $r_1 = r_3$, $r = r_2$, and $\sin r_2 / \sin r_3 = m_3$, the index of refraction for a ray from C into D, and $m_2 / m_1 = \sin r / \sin r_1 = \sin r_2 / \sin r_3 = m_3$. It will be observed that

FIG. 11.



the index of refraction of light in passing from one medium into another in contact with it is the reciprocal of the indices of the two media in air, if we know m_3 and m_1 m_2 can be determined. Also if r_1 becomes 90 degrees $m_2 = m_1 \sin r$.

Dr. Pulfrich's refractometer for chemists will be understood from Figs. 10 and 11. B is a prism whose index is known, and is, say, M (greater than that of C), whose upper surface ab is polished and at right angles with the face bc, which is also polished. A is a lens through which light from a sodium flame passes on its way to the prism B. C is a specimen of the substance whose index is required, and whose under surface is polished, or is a vessel containing liquid, whose under surface corresponds to the upper surface of B.

Consider a ray so taken that ϕ is the critical angle for the substance D. Then $M\sin\phi=m$ (m being the index of refraction for D and air), $\sin r=\sin i / M$; $\sin\phi=\cos r=(1-\sin^2 i / M^2)^{\frac{1}{2}}$ and $m=M(1-\sin^2 i / M^2)^{\frac{1}{2}}=(M^2-\sin^2 i)^{\frac{1}{2}}$. All rays parallel to EF will emerge parallel and be focused by the lens L in the center of the field, while rays having a greater angle of incidence than EF, as EF_1, will be focused in the lower part of the field of the lens and appear dark, since a considerable portion of this light passes into D. Rays having a smaller angle of incidence than EF, as E_2F, will be focused in the upper part of the field of the lens and appear bright, since the light is almost totally reflected back into B.

A person looking into the eye-piece of the telescope will see the field of view divided into two portions, a bright and dark portion.

The apparatus as constructed is shown in Fig. 11. The circle is divided into half degrees and by means of a vernier the amount of rotation is read to minutes. The correct reading for ϕ is found when the appearance in the field of vision is as seen in Fig. 12. The border line between the light and dark portions can be made to exactly coincide with the "cross hair" by the use of the clamping and micrometer screw attached to the triangular support.

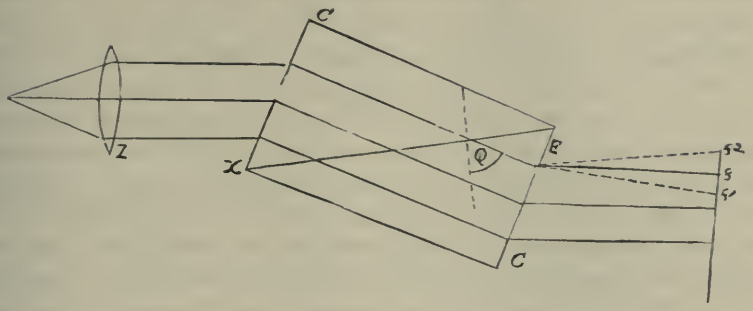
FIG. 12.

A Landolt burner for sodium light or a Terquem burner for monochromatic light would be a convenient accessory, but a Bunsen's burner flame with a piece of rock salt held in it by means of a platinum wire is all that is necessary.

A table giving the index of refraction to the fifth decimal place accompanies each instrument and saves the observer the trouble of calculation.

Prof. Abbe's instrument will be understood from Figs. 13, 14 and 15 : C

FIG. 13.



and C_1 are two similar prisms of the same kind of glass placed with their hypothenuse surfaces together. A drop of the liquid to be examined is placed between them and spreads out into a very thin lamina. Consider rays parallel to FE, coming into the prism C_1, and the prisms so turned on an axis perpendicular to the plane of the paper, so that ϕ is the critical angle for the substance between the prisms. All rays having a greater

FIG. 14.

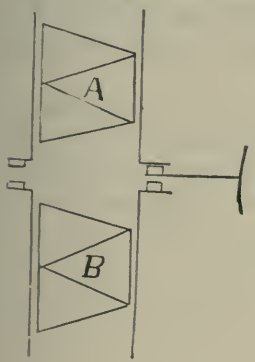
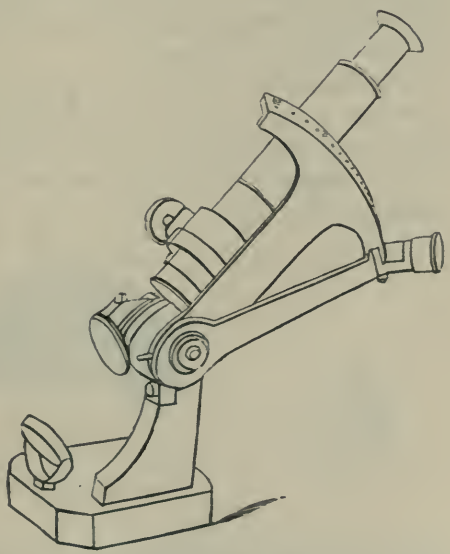


FIG. 15.



angle of incidence than FE, as F_1E, would be totally reflected on reaching the liquid lamina, while all rays having a smaller angle of incidence than FE would be in part transmitted through the prisms and be focused in the upper portion of the field of the lens, the lower portion being dark.

In the Pulfrich instrument the prism was stationary and the telescope moved around it, but in the Abbe instrument the telescope is fixed and the prisms move.

If homogeneous lights were used then the necessary parts of the apparatus would be a source of light, the prisms, and the telescope with scale. If sunlight is used, then the lighted portion of the field of view in the telescope would show a spectrum which would make it difficult if not impossible to decide when the prisms had been turned just enough. Prof. Abbe has remedied this defect in a very ingenious way so that sunlight may be used and the instrument used for determining the dispersion of the substance at the same time the index of refraction is determined. Two equal Amici prisms are so made that sodium light passes through them without changing its direction. They are placed in tubes with flanges having cogs so that when one prism rotates right-handed the other rotates left-handed and at the same rate.

The prisms are placed with their refracting edges in the same direction. In revolving, therefore, the principal planes of the two prisms are always symmetrically inclined to the primitive plane (the plane of the paper in the figure.) In such a system there is dispersion only in the direction of the primitive plane, and it varies from $-2k$ to $+2k$, k being the dispersion of one of the prisms. When the prisms have rotated 90 degrees the dispersion becomes nil, and if the rotation is continued the spectrum is reversed, and increases in length till it reaches a value $-2k$, when the prisms have been rotated 180 degrees.

The instrument as constructed is shown in Fig. 15. The arc is graduated empirically, so that the index is read off directly by means of a lens to the third decimal, and estimated to, say, two units in the fourth decimal place.

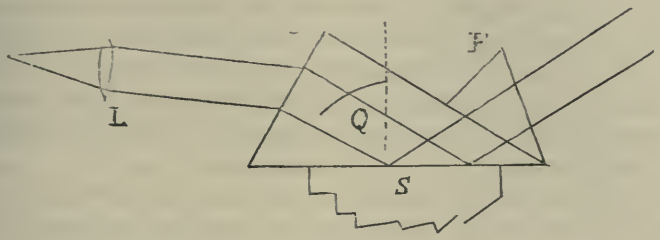
The instrument is adjusted when pure water at 18 degrees gives the reading 1.3330.

FIG. 16.

When the prisms in the telescope tube have been rotated till there is no spectrum, the field of view is divided into a light and a dark portion having a sharp border line between, and the correct reading will be found when this border line divides the diamond made by the "cross hairs," as shown in Fig. 16.

For determining the index of refraction of solids a small prism is cemented to the fixed prism, and the solid whose index is to be determined is cemented to its hypothenuse surface by means of a drop of cassia oil or monobromide of naphthalene. The face of the solid must be polished.

FIG. 17.

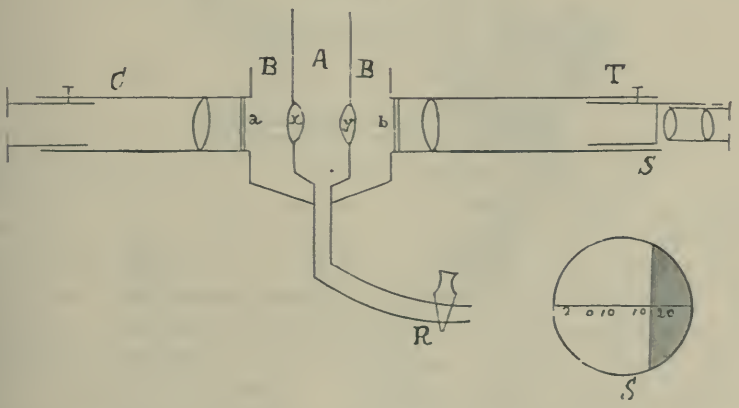


See Fig. 17, where B is the small prism and S a portion of the solid whose index is to be determined.

A table to be used for calculating the dispersion and giving directions for using accompanies each instrument.

The oleo-refractometer of Amajat and Jean is shown in Fig. 18. A is a small cylinder, with two glass windows at x and y making an angle of about 107 degrees with each other, and serving as a hollow prism having a refracting angle of 107 degrees and the refracting edge vertical. It is

FIG. 18.



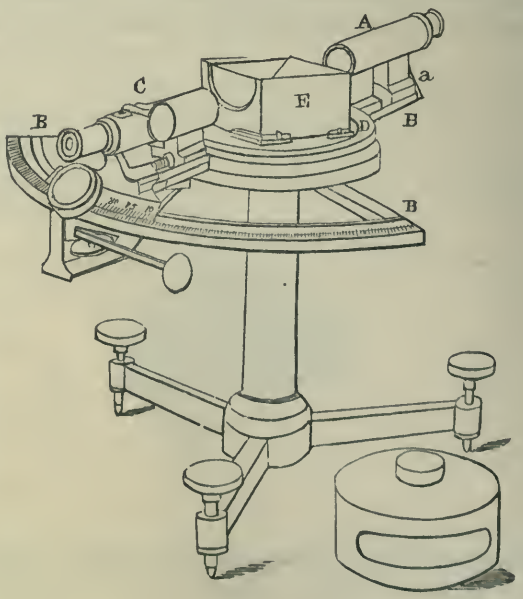
furnished with an exit tube and stop-cock R, by means of which it may be emptied. It is placed in another cylinder B, so that their axes coincide. The cylinder B has two windows, a and b, which are parallel to each other and perpendicular to the visual axis of the instrument. C is a collimating tube, and T is an observing tube containing a transparent, arbitrary, pho-

tographed scale at S. By means of a slider with vertical edge in the collimator tube the scale is divided into two portions, a light and a dark portion. The position of the edge can be changed by means of a screw. The cylinders are surrounded by a bath for regulating the temperature. The instrument is adjusted by placing a normal oil in both cylinders and adjusting the edge of the slider until the dividing line between the dark and lighted portion of the field of view stands at the desired number on the scale. A is then cleaned, and the oil or other substance to be examined is placed in it, when the dividing line in the field will move to the right or left along the scale, the number of divisions through which this border line moves being usually called degrees to the right or left, and indicated by a + or — sign respectively.

This instrument has the advantage that the temperature can be easily changed at the will of the worker, but has the great disadvantage that results cannot be compared unless the standard oils used by different observers are known to be exactly alike, so far as refraction is concerned. It also has the disadvantage of being more difficult to clean, and of requiring the use of more material.

This refractometer is a modification of the refractometer of M. A. Dupré, which is shown in Fig. 19, E being the double prism, the standard

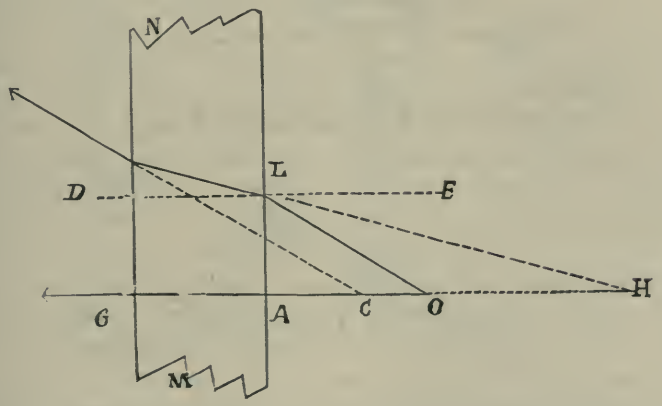
FIG. 19.



prism being of glass instead of being a hollow prism, filled with a standard oil. A graduated arc is used instead of the arbitrary scale.

The use of the microscope as a refractometer for transparent media was first proposed by the Duke of Chaulnes as early as the year 1767. The method depends on the distance between the focus of the incident and emergent rays of a pencil of rays traversing a medium with parallel surfaces. In Fig. 20 let MN be a portion of a transparent medium, O the source of a small pencil of light, C the focus of the emergent pencil, and ED a normal to the surface at L. Then m=sinELO / sinELH=sinLOA / sinLHA=AH / AO = sinI / sinR. Similarly m=sinBCG / sinBHG=GH / GC. LO=AO / cosI ; LH=AH / cosR ; AH=mcosR / cosI(AO). If the pencil is small then AH=mAO. GH=mGC=GA+AH=GA + mAO and GC=GA / m+AO. It is obvious that CO depends on the thickness of the plate and its index of refraction. CO=GO—GC=GA+AO—GA / m—AO=GA—GA / m. CO—GA=—GA / m ; or m=GA / (GA—CO)=t / (t—d), t being the thickness of the transparent medium, and d the distance between the foci of the emergent and incident rays.

FIG. 20.



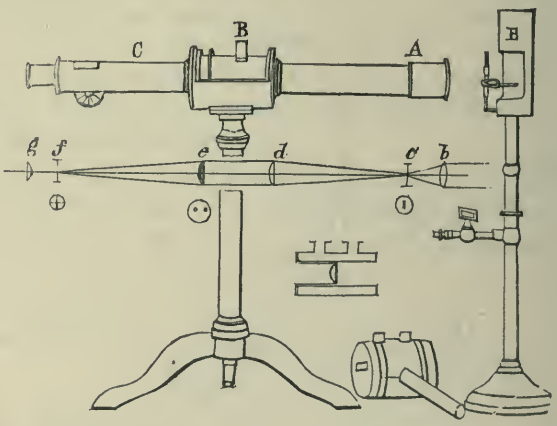
In practice the index is found by first focusing on a mark on a polished plate, then placing a plate of known thickness of the solid in contact with it, and again focusing and noting the difference of the position of the microscope combination from the mark, which is d of the formula. d is found by noting the number of turns given to the fine adjustment screw, the thread of which is of a known number to the unit of length. In the case of liquids, a vessel such as Sorby's absorption tubes, or a glass slide with a ring of glass, and having a mark in the bottom, may be used. Focus on the mark, pour in some liquid, again focus on the mark ; difference is d. To find the thickness of the layer of liquid, focus on some lycopodium seed on the surface. The difference between this distance (reading) and that for the mark in bottom of the vessel before the liquid was put in is the thickness of the liquid.

Piltschikoff's refractometer is a modified application of the microscope method, the liquids being placed in a hollow lens E, Fig. 21, and the difference of the focal position noted. Lenses of different curvatures may be obtained with the instrument.

The preceding descriptions will give a general idea of refractometers, excepting the interference refractometers employed by Arago, Jamin, Mascart, Quincke and others. These instruments are only used by specialists, and do not seem to require more than passing mention in this paper. Spectrometers are described in almost all text books on physics and require no special mention.

Although Ptolemy had determined the angular deviation of a ray of light

FIG. 21.



in passing obliquely into water and glass, the law of sines was not discovered till the year 1620, and did not excite any special chemical interest until about 1800. Wollaston, in describing and reviewing the uses of his total reflection instrument, which was constructed on the same principle as that used in Dr. Pulfrich's instrument, in a paper published in 1802, writes: "For discovering the purity of essential oils such an examination may be of considerable utility, on account of the smallness of the quantity requisite for trial. In oil of cloves, for instance, I have met with a wide difference. The refractive power of genuine oil of cloves is as high as 1.535, but I have also purchased oil by that name which did not exceed 1.498 and which had probably been adulterated by some less refractive oil.

About this time Laplace and Biot and Arago were working on the experimental and mathematical verification of Newton's formula, $(n^2-1)/d=$ a constant.

No advance was made till Gladstone and Dale some fifty years later, while experimenting to ascertain if Newton's formula held for liquids when n and d were changed by varying the temperature, discovered that a for-

mula $(n-1)/d$=a constant, was more nearly in accord with their experiments.

Landolt substituting Gladstone's formula in the formula $M(n^2-1)/d$= a constant (a formula previously suggested by Berthelot), which is Newton's formula multiplied by the molecular weight M of the substance, found that the molecular refraction, as the numbers obtained by Berthelot's formula were designated, was the sum of the atomic refractions of the constituent atoms. Gladstone subsequently showed that the atom of the same element could have more than one atomic refraction. Brühl prosecuting this subject farther established the important result that carbon united ethylene-wise had a higher atomic refraction than when combined as in the paraffin series.

Although the Gladstone formula had no theoretical foundation, and did not stand the test of passing from the liquid into the vapor state, the Newton formula was practically abandoned in its favor.

In 1880 L. Lorenz, of Copenhagen, and H. A. Lorentz, of Amsterdam, published mathematically demonstrated theories, the first basing his demonstration on the generally accepted undulatory theory of light, and the other basing his demonstration on the electromagnetic hypothesis of Maxwell. Both came to the same conclusion, and gave the formula $(n^2-1)/(n^2+2)d$=a constant as a result of their demonstrations. Lorenz and Prytz examined some fifteen substances in both the liquid and vapor states and found a complete accordance with the formula.

This formula having a theoretical foundation and standing the before mentioned test led Landolt and others to test it comparatively. Landolt came to the conclusion that the Lorenz formula was, on the whole, better than the Gladstone formula, although the Gladstone formula was in some cases the better, as in finding the index of a mixture from those of its constituents.

A year after the publication of Landolt's paper, Quincke published a paper in which he compared the results obtained by using the Newton, Gladstone, and Lorenz formulæ, when the density was changed by pressure instead of heat. Lorenz formula gave numbers too small, the Newton formula gave numbers too great, and the Gladstone formula gave six too small and four too large out of ten cases.

Brühl, in his recent work, shows that the Lorenz formula gives much smaller differences in molecular refraction in passing from liquid to vapor states than the others do.

Ketteler, developing a theory of dispersion, finds the formula $(n^2-1)(v-B)=c(1+ae^{-kt})$ connecting the index of refraction with the density of a substance; v being the molecular domain, B being the true volume of the molecule, c, a and k being constants, and t the temperature. This formula is a theoretical one, being developed from the hypothesis that discontinuous ether and molecules can be replaced by two homogeneous and continuous media.

In 1889, Mr. W. Sutherland published a theoretical and mathematical demonstration of Gladstone's formula.

None of these formulæ have been entirely concordant with experimental evidence, the formula of Lorenz being least objectionable.

It may be said, however, that the index of refraction has become as important a property of liquids as is their specific gravity, and should be given in every description as surely as the specific gravity and boiling temperature.

Wollaston's hint as to the use of the index of refraction as a means of determining the probable purity of a substance seems to have given very little impetus to work in that direction. However, as will be seen from the following table, the index of refraction is as good indication of the purity of the substances named as are their other physical properties.

	Index of Refraction at 15° C.	Specific Gravity at 15° C.	Melting Temperature.	Solidifying Temperature.	Relative Viscosity at 15.5° C. in seconds required for outflow.
Olive oil	1.4700	.916	26	21	187
Rapeseed oil, acid free	1.4720	.916	19.5	18.5	261
Sesame oil, fresh	1.4748	.922	23	18.5	168
Cottonseed oil, best American	1.4752	.925	35	32	180
Castor oil, cold pressed	1.4795	.961	.....	.....	2420
Linseed oil	1.4835	.932	24	17.5	120
Poppyseed oil	1.4783	.925	.....	.....	120
	Index of Refraction at 20° C.	Specific Gravity at 20° C.		Boiling Temperature.	
Methyl alcohol	1.3299	.796	.....	66	
Ethyl alcohol	1.3634	.7894	.....	78.3	
Amyl alcohol	1.4080	.8104	.....	131.4	
Glycerine	1.4742	1.2620	.....	290	
Chloroform	1.4980	1.490	—71	61	
Bisulphide of carbon	1.6261	1.27	.....	46	
Ether	1.3545	.720	.....	35	

This table, of course, could be much extended, but I have only purposed giving an example of comparison of physical properties.

If the index of refraction is of equal value with the other physical properties for determining the probable purity, then it takes precedence because of the small quantity of substance required and of the very short time required for taking the index.

In the following table I give the index of refraction of a considerable number of volatile oils, together with some other properties. In many

cases I have taken the index of three different samples. Those marked No. 3 are oils distilled in the Chemical Laboratory of the University of Michigan by students in the senior class in pharmacy. Those marked No. 2 were purchased of Lehn and Fink, and those marked No. 1 are from various other sources, and were obtained from a local dealer in Ann Arbor. The numbers given as indices of refraction are readings of Abbe's refractometer at the temperatures given:

Name of Volatile Oil.	Index of Refraction, Sample No. 1.	Index of Refraction, Sample No. 2.	Index of Refraction, Sample No. 3.	Specific Gravity at Ordinary Temperatures.	Temperature at which they begin to boil.	Rotation for column 10 inches long.	Temperature at which readings of Refractometer were taken.
Cinnamon	1.6000	1.5740	.....	1.035	.....	L	24
Cassia	1.5780	1.5760	.....	1.065	.....	(?)	22
Star Anise	1.5496	1.5500	1.5495	.976–.98	.....	L	22
Sassafras	1.5350	1.5270	1.5280	1.090	230	+7	22
Cloves	1.5290	1.5290	.....	1.060	.....	—4	24
Pimento	1.5320	1.5190	1.5300	1.0374	.....	.....	21.5
Birch	.....	.....	1.5330	.....	218	+38	21.5
Fennel	1.5380	1.4820	1.5320	.97–.99	.....	R	22.5
Wintergreen	1.5330	1.5340	1.5320	1.186	200	+3	22.5
Myrciæ	.....	1.5135	.....	.93	160	R	22
Cedarwood	1.5022	.....	1.5020	.....	.....	.....	21.5
Copaiva	1.4950	1.4995	.....	.89–.92	255	L	21.5
Cubebs	1.4950	1.4945	1.4880	.92–.94	250	R	22
Calamus	....	1.4920	.....	.92–.94	159	+43.5	21.5
Garden Thyme	1.4750	1.4760	1.4910	.88–.895	.....	.....	21.5
Horsemint	1.4920	1.4785	1.4830	.920	.....	.....	22
Hemlock	1.4700	1.4870	.....	.....	.....	.....	22.5
Savine	.....	.....	1.4860	.91	160	L	22.5
Geranium	1.4870	1.4870	.....	.....	.....	.....	22.5
Cedar, jun. Vir.	1.4680	1.4855	.....	.87	155	+3	22
Anethi	.....	1.4855	.....	.88	.....	R	22
Spearmint	.....	1.4850	1.4880	.90–.91	160	L	22
Ginger	1.4860	1.4850	.....	.....	.....	.....	24
Pennyroyal	.....	1.4820	.....	.94	.....	.....	24
Cumin	.....	1.4820	.....	.92	.....	.....	24
Nutmeg	1.4840	1.4810	.....	.93	160	.....	21.5
Caraway	1.4855	1.4795	1.4830	.92–.94	.....	+63	21.5
Dill	.....	.....	1.4810	.87–.88	.....	+206	21.5
Laurel	1.4820	.....	1.4820	.....	.....	—6	22
Origanum	1.4770	.....	.....	.89	.....	.....	21.5
Juniper	1.4750	1.4760	1.4795	.88	.....	L	22.5
Lemon	1.4730	.....	.....	.85–.87	.....	+164	22.5
Orange	1.4720	1.4700	.....	.85	.....	—216	22
Cajeput	1.4680	1.4680	1.4680	.925	160	.....	22.5
Rosemary	.....	1.4680	1.4680	.90	.....	+17	21.5
Lavender	.....	1.4620	1.4640	.89–.90	185	—20	21.5
Wormseed	.....	1.4670	1.4640	.92	.....	.....	22
Wormwood	1.4660(?)	1.4660	1.4660	.965	.....	.....	24
Bergamot	1.4670	1.4655	.....	.875	185	+23	21.5
Coriander	1.4660	1.4650	.....	.87	.....	R	21.5
Peppermint	1.4645	.....	.....	.91	.....	—72	21.5
Camphor	.....	1.4675	.....	.94	180	.....	21.5
Turpentine	1.4680	.....	.....	.87	160	(?)	22

The index of the oil of wormwood I am in doubt about, as the color prevented the obtaining of a sharp division of the field in the refractometer. The oil of garden thyme, distilled in the laboratory (No. 3) shows a remarkably high index as compared with the other samples. Sample No. 1 of oil of cinnamon was an excellent oil, and I think the only true oil of Ceylon cinnamon found in a number of samples. All other samples of oil of cinnamon and oil of cassia were alike, giving the same index of refraction and the same dispersion, and they all gave the same tongue-pricking effect when taken in the mouth. Sample No. 1 gave very little of this effect when taken in the mouth, and was more highly colored than the other samples.

The table shows the index of all these oils to be high enough so that any considerable adulteration with alcohol may be detected. Any considerable adulteration by means of oil of turpentine could be detected by the index of refraction only in, say, the first thirteen, while adulteration to any considerable extent with fixed oils could be detected only in the first ten. The index of refraction would be of doubtful utility in detecting adulteration with chloroform.

The few samples of each oil examined seem to warrant further work in this direction, and I am trying to get a series of samples direct from the manufacturers, and hope in time to have a complete series made in the laboratory.

By examining a considerable series I hope to find the index of refraction, coefficient of dispersion and rotation of plane of polarization, of considerable utility in determining the probable purity of many of the oils.

Perhaps the most useful application of the refractometer may be found in determining per cents. of known substances in solution. As long ago as 1857 Beer and Kremers made a report of some work done on some of the halogen salts of the alkalies and alkaline earths, in which they gave curves showing the increase of the index of refraction with the increase of the concentration of the solution, and at the same time a comparison of the indices of refraction of solutions of like concentration.

In 1868 Dr. Karl Hoffmann, in a paper on transposition in mixtures of salt solutions, and on density and refraction relations of some aqueous salt solutions of different degrees of concentration, gives interpolation formulæ to express the index of refraction of solutions of a few salts.

In 1880 Dr. Wilhelm Lenz published a paper on the determination of the content of glycerine in aqueous solution, in which he gives a table of specific gravities and indices of refraction for solutions containing from 0 per cent. to 100 per cent. of glycerine for each increase of one per cent. A similar table was published in 1883 by Stohmer for solutions containing from 50 per cent. to 100 per cent. glycerine, and another in 1886 by Skalweit has the same range as Lenz's table, but is given for a different temperature.

In the following table are given the specific gravities and indices of refraction at 15° C. taken from Skalweit's table; the specific gravities at 20° C. (water at 20° C.=1), boiling temperature and vapor tension from Gerlach's table, and the indices of refraction taken between 12.5° C. and 12.8° C. taken from Lenz's table, and taken at 17.5° C. taken from Stohmer's table.

Per cent. Glycerine.	Specific Gravity at 15° C.	Specific Gravity at 20° C.	Index of Refraction at 15° C.	Boiling Temperature in Degrees C. under 760 mm. Pressure.	Tension of Vapor of Glycerine Solution at 100° C.	Index of Refraction after Lenz.	Index of Refraction after Stohmer.
100	1.2650	1.2620	1.4742	290	64	1.4758	1.4727
99	1.2625	1.2594	1.4728	239	87	1.4744	1.4710
98	1.2600	1.2568	1.4712	208	107	1.4729	1.4698
97	1.2575	1.2542	1.4690	188	126	1.4715	1.4681
96	1.2550	1.2516	1.4684	175	144	1.4700	1.4670
95	1.2525	1.2490	1.4670	164	162	1.4686	1.4653
94	1.2499	1.2464	1.4655	156	180	1.4671	1.4636
93	1.2473	1.2438	1.4640	150	198	1.4657	1.4625
92	1.2447	1.2412	1.4625	145	215	1.4642	1.4608
91	1.2421	1.2386	1.4610	141	231	1.4628	1.4596
90	1.2395	1.2360	1.4595	138	247	1.4613	1.4579
89	1.2368	1.2333	1.4580	135	263	1.4598	1.4563
88	1.2341	1.2306	1.4565	132.5	279	1.4584	1.4551
87	1.2314	1.2279	1.4550	130	295	1.4569	1.4534
86	1.2287	1.2252	1.4535	129	311	1.4555	1.4523
85	1.2260	1.2225	1.4520	127.5	326	1.4540	1.4506
84	1.2233	1.2198	1.4505	126	340	1.4525	1.4489
83	1.2206	1.2171	1.4490	124.5	355	1.4511	1.4478
82	1.2179	1.2144	1.4475	123	370	1.4496	1.4461
81	1.2152	1.2117	1.4460	122	384	1.4482	1.4449
80	1.2125	1.2090	1.4444	121	396	1.4467	1.4432
79	1.2098	1.2063	1.4429	120	408	1.4453	1.4415
78	1.2071	1.2036	1.4413	119	419	1.4438	1.4398
77	1.2044	1.2009	1 4399	118.5	430	1.4424	1.4387
76	1.2017	1.1982	1.4384	117.4	440	1.4409	1.4370
75	1.1990	1.1955	1.4369	116.7	450	1.4395	1.4353
74	1.1963	1.1928	1.4354	116	460	1.4380	1.4336
73	1.1936	1.1901	1.4339	115.4	470	1.4366	1.4319
72	1.1909	1.1874	1.4324	114.8	480	1.4352	1.4305
71	1.1882	1.1847	1.4309	114.2	489	1.4337	1.4291
70	1.1855	1.1820	1.4295	113.6	496	1.4321	1.4274
69	1.1827	1.1793	1.4280	.....	.....	1.4304	1.4257
68	1.1799	1.1766	1.4265	.....	.....	1.4286	1.4240
67	1.1771	1.1739	1.4250	.....	.....	1.4267	1.4223
66	1.1743	1.1712	1.4235	.....	.....	1.4249	1.4206
65	1.1715	1.1685	1.4220	111.3	553	1.4231	1.4189
64	1.1686	1.1658	1.4205	.....	.....	1.4213	1.4167
63	1.1657	1.1631	1.4190	.....	.....	1.4195	1.4150
62	1.1628	1.1604	1.4175	.....	.....	1.4176	1.4133
61	1.1599	1.1577	1.4160	.....	.....	1.4158	1.4116
60	1.1570	1.1550	1.4144	109	565	1.4140	1.4099
59	1.1542	1.1523	1.4129	.....	.....	1.4126	1.4087
58	1.1514	1.1496	1.4104	.....	.....	1.4114	1.4070
57	1.1486	1.1469	1.4099	.....	.....	1.4102	1.4059
56	1.1458	1.1442	1.4084	.....	.....	1.4091	1.4048

Per cent. Glycerine.	Specific Gravity at 15° C.	Specific Gravity at 20° C.	Index of Refraction at 15° C.	Boiling Temperature in Degrees C. under 760 mm. Pressure.	Tension of Vapor of Glycerine Solution at 100° C.	Index of Refraction after Lenz.	Index of Refraction after Stohmer.
55	1.1430	1.1415	1.4069	107.5	593	1.4079	1.4036
54	1.1402	1.1388	1.4054	.....	.....	1.4065	1.4019
53	1.1374	1.1361	1.4039	.....	.....	1.4051	1.4008
52	1.1346	1.1334	1.4024	.....	.....	1.4036	1.3997
51	1.1318	1.1307	1.4010	.....	.....	1.4022	1.3980
50	1.1290	1.1280	1.3996	106	618	1.4007	1.3969
49	1.1263	1.1253	1.3981	.....	.....	1.3993	
48	1.1236	1.1226	1.3966	.....	.....	1.3979	
47	1.1209	1.1199	1.3952	.....	.....	1.3964	
46	1.1182	1.1172	1.3938	.....	.....	1.3950	
45	1.1155	1.1145	1.3924	.....	.....	1.3935	
44	1.1128	1.1118	1.3910	.....	.....	1.3921	
43	1.1101	1 1091	1.3896	.....	.....	1.3906	
42	1.1074	1.1064	1.3882	.....	.....	1.3890	
41	1.1047	1.1037	1.3868	.....	.....	1.3875	
40	1.1020	1.1010	1.3854	104	657	1.3860	
39	1.0993	1.0983	1.3840	.....	.....	1.3844	
38	1.0966	1.0956	1.3827	.....	.....	1.3829	
37	1.0939	1.0929	1.3813	.....	.....	1.3813	
36	1.0912	1.0902	1.3799	.....	.....	1.3798	
35	1.0885	1.0875	1.3785	103.4	675	1.3785	
34	1.0858	1.0848	1.3771	.....	.....	1.3772	
33	1.0831	1.0821	1.3757	.....	.....	1.3758	
32	1.0804	1.0794	1.3743	.....	.....	1.3745	
31	1.0777	1.0767	1.3729	.....	.....	1.3732	
30	1.0750	1.0740	1.3715	102.8	690	1.3719	
29	1.0724	1.0714	1.3701	.....	.....	1.3706	
28	1.0698	1.0688	1.3687	.....	.....	1.3692	
27	1.0672	1.0662	1.3674	.....	... .	1.3679	
26	1.0646	1.0636	1.3660	.....	.....	1.3666	
25	1.0620	1.0610	1.3647	102.3	704	1.3652	
24	1.0594	1.0584	1.3633	.....	.....	1.3639	
23	1.0568	1.0558	1.3620	.....	.....	1.3626	
22	1.0542	1.0532	1.3607	.....	.....	1.3612	
21	1.0516	1.0506	1.3594	.....	.....	1.3599	
20	1.0490	1.0480	1.3581	101.8	717	1.3585	
19	1.0465	1.0455	1.3568	.....	.....	1.3572	
18	1.0440	1.0430	1.3555	.....	.....	1.3559	
17	1.0415	1.0405	1.3542	.....	.....	1.3546	
16	1.0390	1.0380	1.3529	.....	.....	1.3533	
15	1.0365	1.0355	1.3516	.....	.....	1.3520	
14	1.0340	1.0331	1.3503	.....	.....	1.3507	
13	1.0315	1.0307	1.3490	.....	.....	1.3494	
12	1.0290	1.0283	1.3477	.....	.....	1.3480	
11	1.0265	1.0259	1.3464	.....	.....	1.3467	
10	1.0240	1.0235	1.3452	100.9	740	1.3454	
9	1.0216	1.0211	1.3439	.....	.....	1.3442	
8	1.0192	1.0187	1.3426	.....	.....	1.3430	
7	1.0168	1.0163	1.3414	.....	.....	1.3417	
6	1.0144	1.0139	1.3402	.....	.....	1.3405	
5	1.0120	1.0116	1.3390	.....	.....	1.3392	
4	1.0096	1.0093	1.3378	.....	.....	1.3380	
3	1.0072	1.0070	1.3366	.....	.....	1.3367	
2	1.0048	1.0046	1.3354	.....	.....	1.3355	
1	1.0024	1.0023	1.3342	.....	.....	1.3342	
0	1.0000	1.0000	1.3330	100	760	1.3330	

It will be observed that for a difference of one per cent. content of glycerine for the per cents. near one hundred, there is a difference of twenty-five units of the fourth decimal place for specific gravity, and of fourteen units of the fourth decimal place for indices of refraction, which would, of course, admit of determining smaller differences of content of glycerine by determining the specific gravity, but the determination of the index of refraction is very much more easily made, requiring only a minute of time and only two or three drops of the solution. Moreover one can determine the index of refraction to, say, two units of the fourth decimal place, which admits of the determination of the content of glycerine to two tenths of one per cent.

It will be noted that the difference is smaller for one per cent. difference in content of glycerine if the content of glycerine is small; also that there is a considerable difference in the specific gravity and index of refraction at different temperatures, and that the boiling temperature and vapor tension may be used as a check when the content of glycerine is high.

The table for glycerine will suggest the use of the refractometer for determining the content of many solutions of known substances. As examples we may note the following:

Absolute alcohol	has an index of refraction	0	=1.36340
Acetic acid, 99.5 per cent.	"	"	=1.38200
Sugar solution, ten per cent.....	"	"	=1.34756
Sodium chloride, 8.6 per cent.....	"	"	=1.34702
Zinc chloride, 18 per cent.....	"	"	=1.36719
Calcium chloride, 16.7 per cent.	"	"	=1.37392

The difference of the indices of refraction of

Glycerine and water is	14120	units of the fifth decimal place.		
Alcohol "	3040	"	"	
Acetic acid "	4900	"	"	
Ten per cent. sugar "	1456	"	"	
8.6 per cent. salt "	1402	"	"	

Etc., etc.

It will be seen from these differences that if the changes are at all uniform the determination can easily be made to one tenth of one per cent.

For determining the per cent. reagent in laboratories the instrument can be of much service when tables are constructed like the one given for glycerine. I am working on such tables for acids and alkalis, alcohols and some salt solutions in general use, and hope to publish the same sometime within a year. I am specially interested in working on tables for solutions of acetic acid and alcohol in water.

O. H. E. Ellinger has recently published a paper in which he gives a table of pro mille factors for many solutions of salts by the Amajat Jean refractometer, but this table is of use with that instrument only, since much depends on the standard used, the arbitrary scale, angle of the prisms, etc.

Schwartz has used the index of refraction for determining the extract,

alcohol and specific gravity of beer, but it is of very doubtful utility in such determinations, as it requires an accuracy of two or three units of the sixth decimal place.

On the whole, it seems to me that the refractometer is an instrument which may come into quite general use in wholesale houses for obtaining quickly and without waste the probable purity of many substances. If it does come into quite general use, I think, a very efficient instrument may be placed in the market at a price that would come within reach of all of our wholesale dealers.

I am hopeful that the day is not far distant when it will be used in every laboratory of analytical chemistry of any repute in the country, as an instrument giving as reliable and valuable a physical property as is the boiling temperature or specific gravity. The day has already come when every properly equipped chemical laboratory for scientific research must have a good refractometer.

A paper on Oleum Terebinthinæ, by Chas. T. P. Fennel, was then read:

OLEUM TEREBINTHINÆ.

CHAS. T. P. FENNEL, PH. G., PHAR. D.

Oil of turpentine being classified with the volatile oils, induced the writer to examine commercial products. According to the Pharmacopœia, we expect a volatile oil distilled from turpentine, being a thin, colorless liquid, of a characteristic odor and taste, becoming stronger and less pleasant by age and exposure to air, and of a neutral or faintly acid reaction.

Specific gravity, 0.855 to 0.870. It is soluble in 6 parts of alcohol. Bromine and powdered iodine act violently upon it. When brought in contact with a mixture of nitric and sulphuric acids, it takes fire. The British Pharmacopœia cites neither specific gravity, solubility in alcohol, nor the effect of bromine, iodine, and acids. In its place we find that turpentine commences to boil at about 320° F. (160° C.), and distilling almost entirely below 356° F. (180° C.), little or no residue remaining.

The French Codex is entirely wanting in specification. The German Pharmacopœia gives the boiling point ranging from 150° C. to 160° C. Specific gravity, 0.855 to 0.865.

The general remarks quoted on the pharmacopœial requirements of oil of cloves apply to oil of turpentine. Specific gravity may indicate the presence of considerable portions of adulterants, but the adjustment of these is so carefully made that the factor of specific gravity plays rather a non-important part.

The determination of the flash point, made to conform to quasi legal and commercial requirements, is no factor for purity.

Qualitative tests for usual adulterants are not of much value, owing to the varying character of the adulterants.

A simple test for purity consists in floating a watch crystal containing

5 c.c. of turpentine upon boiling hot water for fifteen minutes; a ponderable residue will indicate impurity. The residue may be resin, petroleum or paraffin oils. As a general practical test, the writer found it very convenient, but for absolute certainty of purity, the test lacks definition. The only constant factor for purity is the boiling point, which is usually ignored. Pure oil of turpentine boils between 156° C. and 162° C., and distils completely below 180° C. The writer examined some twenty samples of the commercial article and was able to differentiate the products of three classes.

Specific gravity varied between 0.82 and 0.865 at 15° C.

Solubility in alcohol varied between 1.5 to 6; bromine and iodine and acids gave characteristic reactions.

Boiling point showed great differences, ranging from 46° C. to 50° C.; 108° C. to 135° C.; 130° C. to 139° C.

The samples were submitted to fractional distillations, the results forming the following classification:

Class No. I.

Specific gravity, 0.82 to 0.85.
Boiling point, 46° C. to 50° C.
Vapors formed in neck of retort between 38° C.–40° C.
1st fraction at 55° C.=8.5 per cent. to 12.5 per cent. Sp. gr., 0.75.
2d fraction at 60° C.=15 per cent. to 25 per cent. Sp. gr., 0.80.
3d fraction at 62° C.=25 per cent. to 25 per cent. Sp. gr., 0.83.
4th fraction at 68° C.=15 per cent. to 12.5 per cent. Sp. gr., 0.848.
5th fraction at 75° C.=18 per cent. to 21.5 per cent. Sp. gr., 0.854.
Residue, 18.5 per cent. to 3.5 per cent.

General characters: The rise in temperature was very gradual, and no deflections. The distillates perfectly clear and of turpentine odor.

The low boiling points and specific gravity indicate petroleum benzin, and the mixture is probably obtained by distilling turpentine and petroleum benzin, and increasing the specific gravity by the addition of resin oil.

Class No. II.

Specific gravity, 0.85 to 0.86.
Boiling point, 108° C. to 135° C.
Vapors formed in neck of retort, between 102° C.–125° C.
1st fraction at 136° C.–142° C.=30 per cent. to 36 per cent. Sp. gr., 0.83.
2d fraction at 142° C.–152° C.=50 per cent. to 56 per cent. Sp. gr., 0.864.
Residue =20 per cent. to 8 per cent. Sp. gr., 0.9.
Containing at 200° C. 3 per cent. to 1.2 per cent. solids.
Residue, tenacious, light in color. Resin.

General characters: Very gradual rise in temperature; distillates clear and of turpentine odor.

The boiling point and specific gravity would indicate a mixture of kerosene fraction and turpentine.

CLASS NO. III.

Specific gravity, 0.81 to 0.825.
Boiling point, 130° C.–139° C.
Vapors formed in neck of retort, between 65° C.–95° C., which readily fell back into the retort.
Bubbles commencing to issue through the liquid at 102° C.
1st fraction at 160° C.–165° C.=12 per cent. Specific gravity, 0.79.
2d fraction at 165° C.–168° C.=14 per cent. Specific gravity, 0.80.
3d fraction at 172° C.=6.4 per cent. Specific gravity, 0.805.
4th fraction at 175° C.–193° C.=36 per cent. Specific gravity, 0.81.
5th fraction at 208° C.=10.8 per cent. Specific gravity, 0.805.
6th fraction at 228° C.=12 per cent. Specific gravity, 0.8106.
Residue, 235° C.=8.8 per cent.

General characteristics: The rise in temperature in the first fraction was very gradual, odor of turpentine prominent up to 158° C., distillate indicating 6 per cent. to 8 per cent.

The temperature of 165° C. was reached, the same remained constant and then gradually decreased to 158° C.; then gradually increased again to 166° C., remaining constant, to be followed again with an increase in temperature to 168° C.

This gradual increase in temperature, to be followed by a gradual depression in temperature equal to the maximum temperature of the preceding fraction, took place in every fraction. Thus the following temperatures were noted in the succeeding fractions: 172° C. to 170° C. to 172° C. to 166° C.; 175° C. very gradual rise to 193° C., then deflecting to 190° C.–192° C.–186° C.–188° C. to 166° C., gradual rise to 202° C. to 196° C. to 204° C. to 208° C. to 206° C.–208° C., remaining constant, then increasing 216° C. to 223° C. to 216° C.–223° C. to 218° C. to 228° C., gradually rising again to 235° C., remaining constant.

The residue remaining being exceedingly disagreeable in odor, like that of pyridine, very limpid but dark colored.

The compound is in all probability a mixture obtained by distillation of bituminous shale, to which a small percentage of turpentine is added.

Some of the fractions were again distilled into fractions of constant boiling point and submitted to special tests, but the writer failed to get results more positive than those obtained by first fractions.

Owing to the complex nature of commercial hydrocarbon oils, this is not surprising, for the determination of exact constituents is exceedingly difficult, and approximation to the truth is all that can be desired. This is best accomplished by fractional distillation and examining the fractions; determining color, odor, specific gravity. Special tests are not of much service, for certain fractions with constant boiling point may contain isomeric hydrocarbons of the same series, as well as members of isologous series, which would necessarily vitiate the results. Thus the amount of bromine or iodine assimilated can not be taken as the equivalent of a

special member of any hydrocarbon series, since the contribution must come from several sources. In like manner the treatment with acids and alkali can not be considered a factor for differentiation, for their effect may or may not have been dissipated in the treatment of the raw material. The treatment of the raw material with acids, and subsequent neutralization, gives rise to products of oxidation of different characteristics, and of variable proportion, depending upon temperature and quantity of mass.

Data of distillation of raw material of known source must furnish the characteristics of the constituents contained therein, and these alone can be considered indicative of source and be subject to comparison.

The following papers were then read by title:

A MICROSCOPICAL AND ANALYTICAL STUDY OF COCA LEAVES.

BY ALFRED R. L. DOHME, A. B., PH. D.

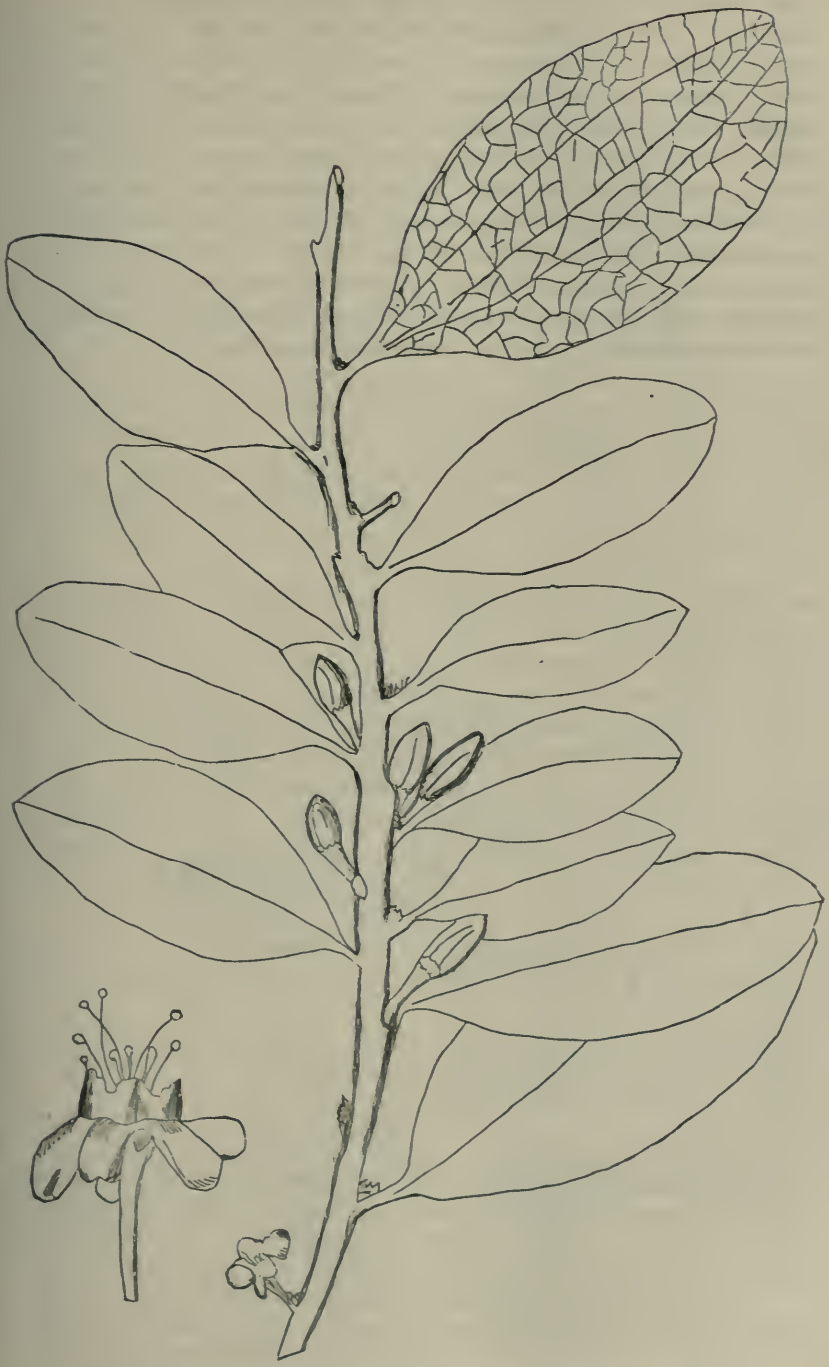
HISTORICAL.—This cultivated, delicate but rather ornamental South American perennial has been known, and its tonic and invigorating properties made use of, since the year 1499, although we learn from the graves and inscriptions of the tombs of the Incas of Peru that the plant had been used as a food stuff and article of luxury much earlier. It was dedicated by the old Peruvians to the sun, and was also used considerably at the time as an article of exchange, taking the place of money. The natives were accustomed to chew it much as tobacco is chewed by the people of this country. This was carried to such an excess that the Vice-king Don Francisco Toledo in 1570 had laws passed prohibiting its use. This was considered rather a harsh measure, as its use enabled the persons chewing it to undergo continuous hardships and perform hard labor without the desire for or necessity of partaking of any food—quite a saving for an economically inclined man, besides the pleasant sensations described as accompanying its use. When the natives intend using the leaves for chewing they prepare them in an especial way, somewhat as the Chinese prepare their opium preliminary to smoking it. In some parts of Peru the leaves are dried, mixed with ashes, lime and powdered calcium carbonate, and then moulded into small sticks resembling a small stump of a lead pencil.

DESCRIPTIVE.—Erythroxylon Coca, *Lamarck*, is a bush growing to the height of about six feet, and well filled with leaves and blossoms. It flourishes and thrives best on the damp slopes of mountains about 2000–5000 feet above the sea level, in a mild warm climate at about 16° 2′ to 16° 20′ latitude, south. The province La Paz on the slopes of the Andes in Bolivia, produces about the largest crops of any in South America. The plant seldom if ever is found growing wild, and is cultivated to such an extent that the annual crop now reaches the enormous figures of about eighty to one hundred million pounds. Most of it is shipped from the ports Arica,

Callao, Mollendo and Trujillo, although a large percentage remains at home for home consumption. The plant is grown from seed and needs no especial care. After the third year it can be stripped of its leaves, in part at least, thrice annually. The leaves are easily dried, being comparatively poor in juice, and are pressed into packages called "cestos," weighing about thirty pounds, by means of banana leaves and coarse linen, and three of such "cestos" are then tied together to form a "tambor," this being as much as one pack-horse can carry. The culture of coca leaves has been tried in other countries, but with questionable results except, perhaps, on the island of Java, where it seems the plant finds surroundings suitable to its mode of life and habits, so that a considerable quantity of coca leaves is shipped to Amsterdam from Batavia. Thence they make their way to the southern part of the Rhine countries of Germany, there to be made to yield to the manipulations of the German chemist the beautiful crystalline alkaloid cocaine.

While a student in the University of Strassburg, Professor Flückiger one day brought to the writer's notice a pamphlet which had just arrived from the island of Java. It was written by a local Dutch chemist, by the name of Dr. Burck, at Tysmania near Batavia, and was entitled "Opmerding over de onder den Naam van Erythroxylon Coca in Ned. Indie gecultivierde Gewassen." It contained some investigations upon the microscopic structure of these leaves, distinguishing two varieties and connecting these with the yield of cocaine obtained by assay. It was read with much interest by the Professor, and at the instigation of the latter, the writer undertook an investigation of the coca leaves of the laboratory collection. Unfortunately, only one variety was found and no comparisons could be made. The matter was dropped there, although the writer made some sketches of the drawings of the leaf, stem and flowers of both varieties given by Dr. Burck in his article. (Figs. 1 and 2.) He called the two varieties raised in Java, respectively: *Erythroxylon Bolivianum* and *Erythroxylon Spruceanum*. As far as he could discover, the writer has not found any notice of Dr. Burck's article in any of our leading pharmaceutical journals. While passing through the establishment of Messrs. C. F. Boehringer & Soehne at Waldhof, near Mannheim, the writer asked Dr. Engelhorn, the head of the firm, if he had heard of Dr. Burck's work, to which he replied that he had not, but would like to procure a copy if possible, as it would probably be of some use to him. Having recently had occasion to assay a number of samples of coca leaves, the writer decided to investigate the matter microscopically and analytically, and see if some interesting data could not be obtained. As is well known there are two varieties of coca leaves that come into this country—named after two cities of Peru where they in all probability are either grown or whence they are shipped. The varieties are "Truxillo" and "Huanuco" coca leaves, varieties that are distinguished usually by their difference in appearance. The "Huanuco"

FIG. 22.



Erythroxylon Bolivianum, Burck, Huanuco Leaves.

leaves are usually of a dark green color and a thick leathery consistency, while the "Truxillo" leaves are of a light green color and a fragile brittle thin consistency. The "Huanuco" leaves derive their name from the city of Huanuco, lying between the Marañon and Hualloga rivers on the slopes of the Andes mountains, in the central part of Peru, while the "Truxillo" (properly Trujillo) leaves are named after the port of Trujillo in the northern part of Peru. While this commercial *i. e.* macroscopic mode of distinguishing the leaves is not absolutely correct, it answers the purposes in most cases. The "Huanuco" leaves correspond to Dr. Burck's "*Erythroxylon Bolivianum*" and the "Truxillo" leaves to his "*Erythroxylon Spruceanum*." The following drawings (Fig. 22 and 23) show the appearance of the two varieties—macroscopically:

FIG. 23.

Erythroxylon Spruceanum, Burck, Truxillo Leaves.

Assay.—Samples of both varieties of leaves were ground to a No. 30 powder and subjected to assay by the following method:

10 grammes of the powdered leaves were placed in a 200 c.c. Florence flask and macerated for twenty-four hours, shaking at regular intervals, with a mixture consisting of 70 c.c. of benzin, 25 c.c. of ether and 5 c.c. of a mixture of concentrated ammonia 1 part, absolute alcohol 9 parts (100 c.c. in all). After standing thus for twenty-four hours 50 c.c. were filtered off and shaken in globular* separators, with successive portions of 10 c.c. of water and 2 c.c. of a five per cent. solution of sulphuric acid, until a drop of the latter gave no cloudiness upon treatment with a solution of mercurio-potassium iodide. The acid solutions were combined into one separator and treated with about 15 c.c. of a benzin-ether mixture to remove all the coloring matter, etc., taken up by the acid water. They were then made alkaline with ammonia and treated with two successive portions of 20 c.c. of ether, the latter being drawn off into a tared beaker. In order to remove the ether (and with it the cocaine) that had been dissolved by the water, the latter was treated with 20 c.c. of chloroform, which readily removes the last traces of cocaine from the alkaline liquid.

The chloroform was then drawn off into the tared beaker containing the ether extracts and all evaporated, and finally heated to constant weight at 100° C. and weighed. This gave the gravimetric result. The residues were then dissolved in decinormal hydrochloric acid by the aid of gentle heat, and the excess of the acid titrated with centinormal alkali, using a decoction of Brazil wood as an indicator. This gave the volumetric result. As has been clearly demonstrated in another paper presented to this association† the only known reliable method of assaying at present is just this last mentioned method of titration by means of volumetric acid solution. The results follow:

	Sample A.	Sample B.	Sample C.
Huanuco leaves‡ (Erythrox. Bolivianum)..	Gravimetric, 0.87% Volumetric, 0.61%	Gravimetric, 1.75 % Volumetric, 0.39 %	Gravimetric, 0.746% Volumetric, 0.56 %
Truxillo leaves‡ (Erythrox. Spruceanum)..	Gravimetric, 0.79% Volumetric, 0.18%	Gravimetric, 0.606% Volumetric, 0.065%	Gravimetric, 0.575% Volumetric, 0.053%

*The experience of the writer has been that a globular separator, drawn to a tube about an inch long between the globe and the stop-cock, will enable the operator to shake the enclosed liquids more readily and advantageously, and with less chance of forming an emulsion, than any other separator he has used.

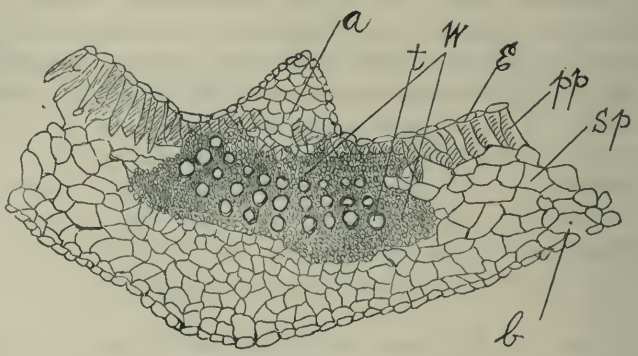
† Caspari and Dohme—"The Value of Titration with Volumetric Acid Solution as a Means of Assaying Alkaloidal Drugs and Galenical Preparations."

‡ These leaves were obtained from different parties to insure their being from different lots, each party sending samples of both kinds.

From these results we see that Huanuco leaves are better than Truxillo leaves as far as their yield of cocaine is concerned; for although the gravimetric results do not show such a great difference, the volumetric results do. This is proof positive that by the method used, being about the best method known to the writer, the gravimetric results for coca leaves are almost absolutely unreliable.

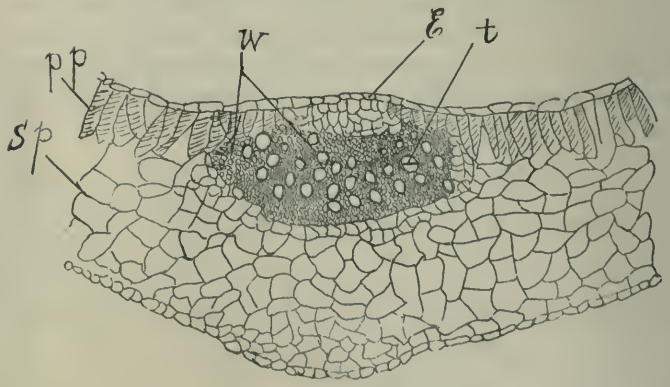
Microscopical Examination.—If several good sized, sound and well

FIG. 24.



Huanuco Coca Leaves.
(*Erythroxylon Bolivianum*, Burck.)

FIG. 25.



Truxillo Coca Leaves.
(*Erythroxylon Spruceanum*, Burck.)

pp—palisade parenchyma; sp—spongy parenchyma; t—tracheotic ducts; w—woody fibres and sieve ducts; e—epidermis; a—apex of midrib; b—breathing cells.

cured Huanuco and Truxillo leaves are soaked in water for several hours and thin cross sections of them, cut so as to include the mid-rib, made by means of a sharp flat ground razor or a microtome, we are in a position to

examine them under the microscope and see if we have a ready means of distinguishing the Truxillo from the Huanuco leaves microscopically. As has already been pointed out,* it is essential to have the sections cut very thin, in fact so thin that they appear transparent, even to the naked eye. The following drawings will show quite plainly just what difference there exists between the two kinds of leaves, and just how readily we can distinguish them at once by it. (Figs. 24 and 25.)

The distinctive differences to be noted are the apex of the midrib in the case of the Huanuco leaves and its absence in the case of the Truxillo leaves; furthermore the spread out and almost flat position of the woody fibres and ducts in the case of the Huanuco leaves and their more circular and condensed position in the case of the Truxillo leaves. Otherwise there is little difference to be noted. The leaves hence that show the apex and have their woody fibres and ducts spread out rather flat across the section are those that yield the most cocaine, and are hence the most valuable.

BALTIMORE, *June 23, 1893.*

CONTRIBUTION TO THE LITERATURE OF STRYCHNIN DETERMINATIONS.

(From the Analytical Laboratory of Parke, Davis & Co., Detroit.)

BY J. B. NAGELVOORT.

I.

Supposing that every one rightfully interested in the progress of pharmaceutical chemistry is familiar with the important controversy laid before the Am. Pharm. Association, in 1892, between two respectable chemists (Mr. Snow and Mr. Gerock) on the subject of "Separation and Estimation of Strychnin and Brucin," the writer offers his experience in the case. He hesitated some time before deciding to offer these notes for publication. Some one might see his predecessor in this investigation in a light in which he does not wish to place him. It is, however, selfish, illiberal and unscientific to withhold the good results obtained by (a modification of) Gerock's process.

I hope that the information will be received in the same spirit in which it is given.

It will be well to commence this contribution where Mr. Snow left off, and quote verbatim from his paper, presented to the late A. P. A. meeting, in 1892, concluding:

"Altogether, this subject (of separation and estimation of strychnin and brucin) is a most discouraging one, and though I have performed many experiments, have as yet nothing but negative results to offer."

It sounds like a pleonasm, but is nevertheless true, that Gerock's separa-

* Dohme—"The Practical Use of the Microscope in Pharmacy,"—Proceedings Amer. Pharm. Assoc., 1892, page 244.

tion of strychnin and brucin, as found in the Arch. d. Pharm., 68, year 1889, page 158, gives good results *if* modified in some details and elaborated in others. Disastrous results are the consequences of a literal application of the process as given in the Arch. d. Pharm., 1889, p. 160. I fully agree with Mr. Snow in this, but it seems that my colleague did not go far enough with his experiments. Modified, as it was found to be the best to do, it is as good a process as others.

It is a step in the right direction (Gerock's process), just as Dunstan & Short* and Beckurts'† processes were, notwithstanding that others are not equally successful as the authors, in estimating strychnin by the ferrocyanate methods.

The methods suggested in the pharmaceutical press by different writers [titration of the total alkaloids in Semina Strychni] (Pharm. Record, Caspari, Nov. 1892 ; Apoth. Zeitung, Partheil, 27th Aug. 1892 ; Lloyd, A. P. A. papers, 1892 ; Helfenberger Annal., 1891, 46), are ARBITRARY and irrelevant to the question at issue—Strychnin estimation, where the ratio of activity of strychnin to brucin is as 1 : — 38 (Arch. der Pharm., 1890, p. 347). Perhaps the process of Gerock may save Semina Strychni and preparations thereof *for a little while yet* from their ultimate fate, to follow "Semina" Santonici, Cortex Peruvianus, Folia Sennæ, etc., *to the garret.* The following figures will prove one of the principal statements made by this paper, *i. e.*, that the chief features of Gerock's process are good :

Taken.	Found.
0.032 Strychnin	0.032 Strychnin.
0.023 "	0.0225 "
0.021 Brucin	Nothing.
0.032 "	"
0.028 Strychnin	0.026 Strychnin.
0.016 Brucin	Nothing.
0.034 Strychnin	0.0332 Strychnin.
0.048 Brucin	Nothing.

		Strychnin.
0.254	total alkaloid from Sol. Ex. Nux Vom.	0.0975 = 38.4 per cent.
0.203	" " same "	0.088 = 43 per cent.
0.159	" " Fl. Ex. "	0.0646 = 46 per cent.

It has to be proved here that the consequences of a literal following of Gerock's process for the separation of strychnin, as described in the Arch. d. Pharm., 1889, page 158, are disastrous.

1. Gerock says : collect the picrates (of the total alkaloids) on a filter and wash until the wash-water is colorless.

Writer found this to be an impossibility. I have continued the washing of a precipitate for three days, of 10 hours, with cold hydrant water (12°,

* Pharm. Journ. and Transact. for Oct. 13, 1883. †Arch. d. Pharm., 1890, p. 338.

winter time), and my filtrate was still of a yellow color on the third day. I have evaporated some of the wash-water, and obtained strong strychnin reaction with H_2SO_4 and $K_2Cr_2O_7$, and brucin reaction with HNO_3, in the residues.

2. It is not an easy task to entirely remove the picrates of the total alkaloids from filter paper—after they had been dried at 105° C., as Gerock prescribes, before they are submitted to the destructive action of HNO_3 of 1.056 sp. gr., and to preserve the filtrum for further use; the fine precipitate has usually to be scraped off (brushing off does not succeed very well), and filter paper dried at 105° is very brittle, breaking easily.

3. As Mr. Snow observes rightly, there are no prescriptions given by Gerock about the quantity HNO_3, in relation to a certain amount total alkaloid, neither about the time and temperature of the exposure of the picrates of the total alkaloids to the destructive action of the dilute acid. One has to find out these details, at an enormous expense of time, labor and materials, before one can use the process.

4. The factor to calculate strychnin from the undestroyed strychnin picrate at 105° C. is not given by Gerock. But this is an oversight, no objection to the method.

II.

Details for the determination of strychnin in preparations of Semina Strychni:

Take the tare of a small flask, holding about fifty (50) c.c., of a good bulb form; weigh in it a small quantity not far exceeding one (1) gram of solid extract or powdered extract, nor five (5) grams of fluid extract. This *modus operandi* is to be preferred over an exact weighing of one (1) gram, the elastic nature of solid extract Semini Strychni making it very bothersome to weigh it. When the accurate quantity (1.2 g., or 1.1 g., or 1.05 g., in case of a solid or powdered extract) is decided upon, add five (5) c.c. of ten per cent. (10%) H_2SO_4, to the contents of the flask, pay no attention to it if some of the solid extract stick to the neck, cover it—do not cork it—with a small beaker, and warm the whole on a sand-bath. Hereby is obtained, without any difficulty, and in as little time as possible, a homogeneous mixture of the solid extract and the acid, without loss of material and without any attention being required. From a fluid extract the alcohol is to be evaporated off first, and the residue afterwards treated as prescribed for solid extract. Wash the acid mixture, when cold, three times, with (alcohol free) ether; reject ether. Make alkaline with ammonia; use strong ammonia in order to keep a small quantity fluid. Exhaust with ether; this gives purer alkaloid than a mixture of ether and $CHCl_3$ does; collect, according to analytical rules, the solution of the alkaloid in a tared beaker, *not* in an evaporating dish (reasons for this to follow) of fifty (50) c.c. capacity.

Evaporate small quantities of ether (10—15 c.c.) at the time, to pre-

vent it from creeping over the edges; dry residue to constant weight (let us say this was found to be 0.168).

Dissolve the thus obtained total alkaloids (these details also apply to an assay of 5 g. Semina Strychni) in five (5) c.c. N/10 H_2SO_4 (as a minimum) and one to two (1—2) c.c. more as the occasion requires, by slightly warming. When the analysis of the Semina Strychni (or of one of the preparations thereof) has been carried out correctly, the solution of the total alkaloid will be clear, but colored. Cool. Dull the excess of acid off with N/10 NaOH, from a burette or pipette, and, when nearly neutral, add an excess of a saturated solution of "picric acid."* Fill beaker with ice-water, and keep it in a cool place (window sill of working room in winter time) until the precipitate is clearly settled. Slowly rotating or stirring with a glass rod facilitates this.† Verify with an additional drop of "picric acid" solution, if there is an excess of "picric acid;" if not, more has to be added. Decant as closely as possible with an appropriate syphon and wash four (4) times. Dry the picrates in the beaker used.

Add twenty-five (25) c.c. nitric acid of 1.056 sp. gr., warm the picrates (of which we may consider 0.150 g. an average quantity under operation), with it for half an hour to 60°, stirring with a glass rod every 15 minutes; cool. Neutralize carefully with ammonia water: the color of the fluid will become darker when the neutralization point is reached. Acidulate again immediately with acetic acid; use a glass rod, moistened with hydrochloric acid, to control the neutralization of the excess of nitric acid with ammonia; a piece of litmus paper cannot be used in the highly colored fluid. Let the undecomposed strychnin picrate settle down; wash by decantation, as before, four times, with cold water, dry to constant weight in the beaker, weigh and calculate to strychnin, and to percentage; e. g.

$$\frac{\text{Strychnin picrate} \times 59.32}{100} = \text{Strychnin.}$$

DETROIT, *May, 1893.*

CONCLUDING REMARKS.

After these notes had been written and were laid aside for a while, to offer them at the proper time to your association, the writer repeated again the whole process of Gerock,‡ as modified in the pages above.

*This proceeding of neutralizing is, therefore, preferable, because it allows the operator to add the smallest quantity of acid and NaOH needed, without difficulty. Use Cochineal tincture as indicator.

†This settling requires a little patience, but one is amply repaid by the results. At first the picrates of S. and Br. settle down slowly. But, after one washing, when the Sodium Sulf. solution is removed, the process works smoothly.

‡T. E. Gerock, "Trennung des Strychnins vom Brucin," Arch. d. Pharm., 1889, p. 158: Die Alkaloide werden unter kurzem Erwärmen auf dem Dampfbade aus möglichst neutraler Lösung mit Pikrinsäure ausgefällt. (Besonders das Brucinpikrat, welches in der Kälte sich sehr langsam absetzt, wird dadurch flockiger und das Filtriren ist nachher

I entered under date of June 30, 1893, in my note-book, the following facts:

Standard fl. ext. nuc. vomicæ, 10 g. (taken),
Yielded 0.153 total alkaloid, dried to constant weight at 105°,
Yield of total picrates (105°), 0.226 g.,
Yield of strychnin picrate (105°), 0.106 g.,
$\times$ 0.5932 = strychnin, 0.0628 g.,

$$\frac{0.0628 \times 100}{0.153} = 41\,\%$$ strychnin in total alkaloids obtained.

July 20, 1893, page 166.

Sol. Ex. Nuc. Vom., 1.481 g., yielded 0.254 total alkaloid (105°).
Yield of Strychnin picrate, 0.167×0.5932=Strychnin 0.9906=40 per cent. of total alkaloid obtained.

RECENT EXPERIMENTS WITH IPECAC ROOT.

BY ALFRED R. L. DOHME, A. B., PH. D.

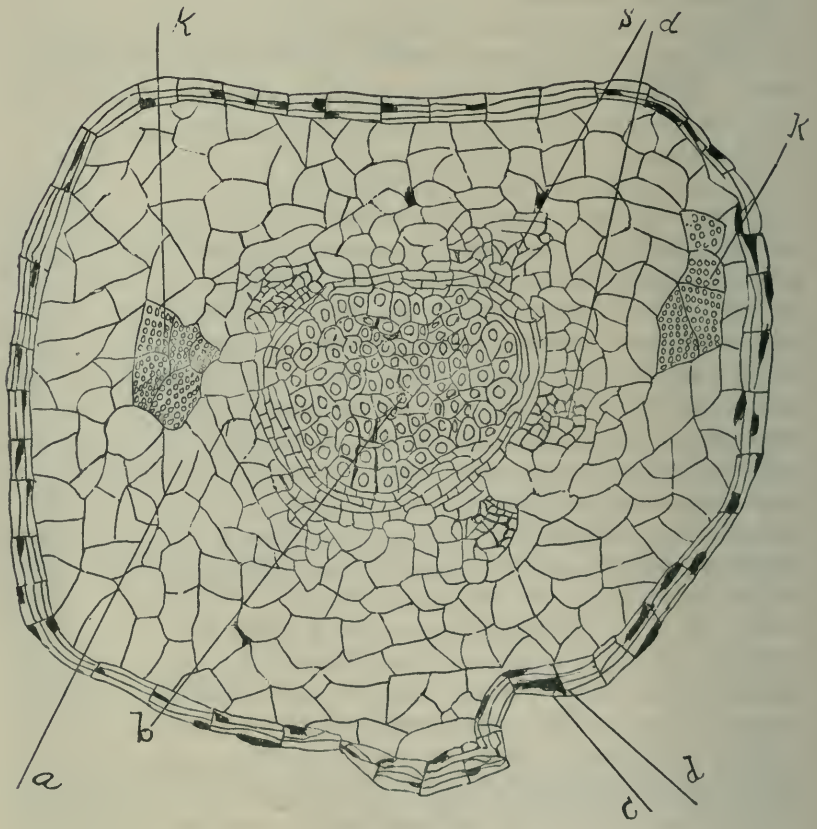
Having had numerous occasions to handle, examine and assay various kinds and grades of ipecac root, it occurred to the writer that it might be possible to determine the location of the emetine in the root. This is generally supposed to repose in the horny envelope, (*a*, see Fig. 26) covered with annulated rings, which surrounds the woody central cylinder (*b*, see Fig. 26). It is for this reason that as a rule the thicker root, generally termed "fancy" in commercial vernacular, is the highest priced and most generally preferred; most persons arguing that if this envelope contains the emetine, and the thick "fancy" root is made up principally of this envelope, it is safer and better to buy the "fancy" root. Flückiger * says that it is well known that the central woody portion of ipecac root contains little or no emetine, and that it is not known whether the cork layer or the cortical parenchyma is the seat of the alkaloid. A microscopic examination of the root will show that the cortical parenchyma is not colored, while the cork layer is—the color being exactly that of emetine residues obtained from assays of ipecac root. Now it is generally admitted that emetine is combined with ipecacuanhic acid in ipecac root, and as this re-

erleichtert.) Nach einiger Ruhe werden die Pikrate auf einem tarirten Filter gesammelt, mit kaltem Wasser ausgewaschen, bis letzteres farblos abläuft, bei 105° C. getrocknet und gewogen. Man klopft nun den Niederschlag so gut als möglich vom Filter in ein Becherglas und giest Salpetersäure von 1,056 spez. Gewicht, die auf dem Dampfbade erwärmt wurde, zu wiederholten Malen durch das Filter, um das anhängende Brucinpikrat zu zerstören. Diese Salpetersäure wird nun zur Hauptportion des Niederschlages gebracht und damit einige Zeit auf dem Dampfbade erwärmt. Alsdann wird genau neutralisiert, mit einer Spur Essigsäure versetzt (Strychninpikrat ist sowohl in Salpetersäure als in Alkalien löslich, in Essigsäure hingegen bei solcher Verdünnung nicht merklich); nach dem vollständigen Erkalten wird das zurückbleibende pikrinsaure Strychnin auf das schon angewandte Filter gebracht, wie oben gesagt, gewaschen, getrocknet und gewogen. Das Brucin berechnet sich aus der Differenz beider Gewichte.

* Flückiger—Pharmakognosie des Pflanzenreichs. III editon, page 425.

appears with the emetine, as the ammonium salt, in part at least in the final extract of the assay, and has the color of the cork layer as seen under the microscope, the chances are that the emetine is to be found in the cork layer rather than in the cortical parenchyma. In order to bring some experimental evidence to bear upon the subject, it was necessary to separate the various parts of the root and to examine them separately as to their

FIG. 26.



Ipecac Root.

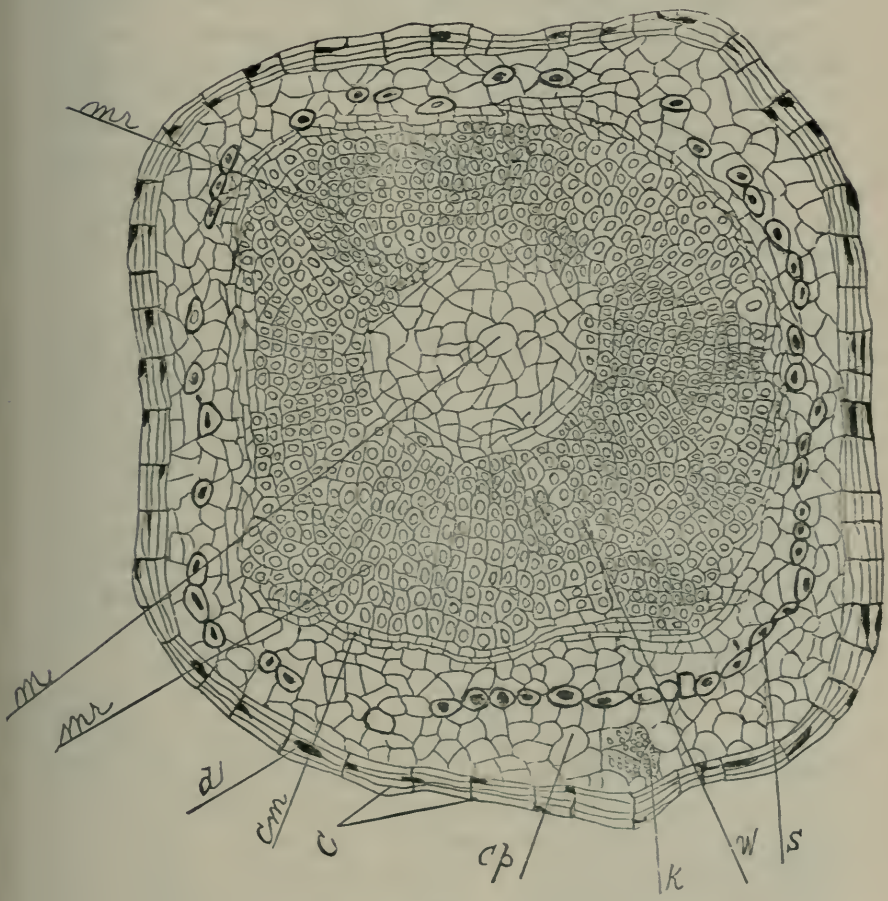
a—Cortical envelope. *c*—Cork cells. *sd*—Sieve ducts.
b—Woody cylinder. *d*—Brownish-red deposit. *k*—Grains of starch.

content of emetine. To that end a quantity of ipecac root from different lots was deprived of its cortex by scraping, care being taken to use only non-annulated roots, hence little cortical parenchyma, and thus separate the woody central portion (part scraped bare, see *b*, Fig. 26,) from the cortex (part scraped off as scrapings, see *c*, Fig. 26). These were then ground

separately to a No. 30 powder and assayed separately. To facilitate matters we will describe the different kinds of roots examined, and give their names as follows:

"Fancy" A.	"Wiry" A.	"Woody Portion" A.	"Wiry Scrapings" A.
"Fancy" B.	"Wiry" B.	"Woody Portion" B.	
"Fancy" C.	"Wiry" C.	"Woody Portion" D.	"Wiry Scrapings" B.
Etc.			

FIG. 27.



Ipecac Root.

m—Medulla.	*s*—Stone cells.	*cm*—Cambium.
mr—Medullary rays.	*c*—Cork cells.	*d*—Brownish-red deposit.
w—Woody fibre.	*cp*—Cortical parenchyma.	*k*—Grains of starch.

Where A, B, C and D are four distinct samples of ipecac root, and "Fancy," "Wiry," "Woody Portion," etc., are terms described below. "Fancy" root denotes the thick large root possessing annulated rings, and

consisting largely of cortical parenchyma gorged with starch (see Fig. 26). "Wiry" root denotes the thinner ordinary root, without annular rings, consisting mainly of an inner woody root with a thin cortex. (See Fig. 27.) "Woody Portion" denotes the inner woody portion of the root after the cortex has been completely removed by scraping, and presents a perfectly white appearance. "Wiry Scrapings" denotes the cortex scraped from the "Wiry" root.

The method of assaying the roots adopted was that of Lyons* which has always yielded the writer the best results,† and which is in brief as follows:

"Ten (10) grammes of ipecac root in No. 30 powder or finer, are shaken with 100 c. c. of Prollius' Fluid and set aside for about fifteen hours. Fifty cubic centimeters are then filtered off and the ether evaporated. Next about 5 c. c. of two per cent. sulphuric acid are added and stirred with the residue, adding a little ether to redissolve the resin, fats, etc., and insure complete solution of all the emetine in the acid. Now evaporate all the ether on a water bath, and filter the acid liquid into a separating funnel and wash both beaker and filter with acid water. Return the small filter to the beaker and again treat with ether and acid as before. Filter again. Continue this until a drop of the acid solution no longer renders turbid a solution of mercurio-potassium iodide. Add 10 c. c. of ether to the separating funnel and shake with the acid solution therein contained after closing it tightly. Separate the ether and pour into the waste ether bottle. Now render alkaline with ammonia and shake out the alkaloid with a mixture consisting of three parts of ether and one part of chloroform, using about 15 c. c. of the latter mixture at a time and continuing until a drop of the alkaline solution no longer becomes turbid after acidifying, when treated with a drop of a solution of mercurio-potassium iodide. Evaporate the combined ether-chloroform solutions to dryness at a moderate heat, finally heating to constant weight at 100° C., in a weighed glass evaporating dish. Below are appended the results:

Drug taken in No. 30 powder.	Gravimetric per cent. of Emetine.	Per cent. of Emetine by titration of previous results.
"Fancy" A.....	1.92	1.36
"Fancy" B.....	1.87	1.29
"Fancy" C.....	1.88	1.36
"Fancy" D.....	2.10	1.44
"Wiry" A.....	2.80	2.03
"Wiry" B.....	2.10	1.88
"Wiry" C.....	2.30	1.69
"Woody Portion" A.....	1.27	0.56
"Woody Portion" B.....	0.77	0.55
"Woody Portion" D.....	0.68	0.44
"Wiry scrapings" A.....	2.95	2.18
"Wiry scrapings" B.....	2.80	2.17

* Lyons—Manual of Pharmaceutical Assaying, § 29, page 20.

† Dohme—Pharmaceutical Review, vol. I, page 15.

CONCLUSIONS.

From these figures, and the microscopical examination of the root, may be deduced the following conclusions:

I. That but little emetine is to be found in the greater part of the parenchyma, which is gorged with starch and is colorless, while the parenchyma nearest the cork layer, as well as the cork layer itself, possesses the color of emetine residues obtained in assays of ipecac root to a degree, and shows secretions which are most probably emetine ipecacuanhate in all parts of them.

II. That the "Wiry" root yields the largest percentage of emetine.

III. That the inner "Woody Portion" of the root contains very little emetine.

IV. That most of the emetine is situated in the cork layer, and the parenchyma cells closest to the cork layer.

BALTIMORE, *June 26th, 1893*.

THE COMMERCIAL VARIETIES OF OPIUM.

BY ALFRED R. L. DOHME, A. B., PH. D.

The opium that enters this country is almost without exception Asia Minor gum shipped from Smyrna.

Descriptive: Opium is derived from the plant *Papaver Somniferum*, L., var. *glabrum*, which possesses red, lilac or white flowers, and an almost spherical calyx. Milk ducts permeate the latter, and it is from them that the white juice is exuded, which when dried yields the commercial gum known as opium. *Papaver Somniferum* thrives in almost all countries, those in the far north and south alone excepted, but is raised as an article of commerce principally in Asia Minor, Macedonia, Persia, India and China. It requires well fertilized and well-watered ground and considerable care and attention. In Asia Minor the plants are raised and looked after by the peasants of the inland countries, the seed being sown in the autumn just after the heavy rains prevalent at that season. The dangers that threaten opium crops are spring frosts, rainless summers and grasshoppers. Shortly after the petals have fallen off, the calyxes are cut with a pointed knife which is covered with cord and sealing wax, and leaves only enough of the point exposed to penetrate far enough into the calyx to make a deep incision and still not sever the same from the stem. The cut is made horizontally at the lower edge of the calyx, almost all the way around. It is customary to cut the plants in the afternoon, thus enabling the exuded juice to become sufficiently dry by the following morning to allow of its being readily removed. In India, where several millions of peasants, by special permission from the Government, raise and collect opium, they use a sharp curved iron instrument, called a "nashtar," to cut the calyxes. The incisions are usually four to six in number, and are made vertically instead of horizontally. This increases the yield of opium to all

appearances, for Indian poppies yield about 0.08 grams of opium to the calyx, and Asia Minor poppies only 0.02 grams. The dried drop of exuded juice, usually termed "tear," is scraped from the calyxes in the morning, and placed into a box which the workman carries on his breast suspended by a strap around his shoulders. The tears are then worked into breads which are wrapped in dried poppy leaves, and then packed in sacks and sealed. These are then put into baskets usually termed "couffes" and hauled by mules to the seaports. Here they are dried so as to avoid fermentation during transit, but this is seldom done carefully enough as several observers on the spot have reported.

In Persia the variety *Papaver Somniferum Album* is raised largely. The tears are not made into breads, but are treated with the boiled juice of grapes, apricots, etc., and some linseed oil and starch. This forms a uniform stiff mass, and is moulded into square cakes or circular disks which are wrapped in red unglazed paper. This Persian opium is devoid of the usual narcotic smell, and, besides being stiffer and harder, is almost entirely free of poppy leaves, stems and fragments of calyxes. Very little of either the Indian or Persian opium comes to this country, the greater part of it being kept at home or shipped to China, where it seems there is such a large demand for opium that despite the fact that the two Chinese provinces Szechuan and Yuennan alone yield more opium than all British India,* they still have use for nearly all that Persia and India can produce. Although the Chinese use opium as extensively as we do tobacco, they have no word of their own for it, and have adopted an Arabian word, "O-fu-yung." They raise their opium much like the natives of India and Asia Minor do, but usually employ skilled labor, paying them good wages, hence the high price of the commodity, which is said to be on a par with silver in China. They prepare it by roasting it slightly, then redissolving it by adding water, and finally evaporating it until it assumes a stiff consistency. This extract is called *Tschandu*, and is ready for the pipe, a piece the size of a pea being used for a smoke. It does not burn well, and they are compelled to touch it to a small lamp, kept beside them for that purpose, several times ere it is laid aside as finished. The charred remains, called *Tinco*, are sold to persons of more moderate means, who smoke their turn at it. After they have become narcotized by it, it changes its name again, being termed *Samsching*, and then passes to the lower classes, who puff away at it until it is reduced to inert ashes. Two or three grams of "Tschandu" will produce a complete narcosis. The principal districts in which Asia Minor opium is grown are Gheve, Yerli, Malatia, Karahissar and Balukissar, and from here it is shipped to Constantinople and Smyrna. The best opium comes from the Macedonian districts, and is shipped from the port Salonica. Poor opium containing

* The amount of opium exported from India in 1888 was 15,000,000 pounds.

less than eight per cent. of morphine is called *Roba Commune*, and comes in large lumps, much larger than the ordinary breads. Still poorer opium as well as adulterated opium is called *Chikinti*, and is sold at low prices to manufacturers of morphine. The varieties of opium are usually named after the districts in which they are grown. Thanks to the kindness of Messrs. Dodge and Olcott of New York, the writer was enabled to procure specimens of seven varieties of opium in original packages, direct shipment from Smyrna, viz.: Salonica, Balukissar, Karahissar, Gheve, Yerli, Malatia and Persian opium. Indian and Chinese opium could not be obtained.

Microscopic examinations:

a. Salonica — breads wrapped in poppy leaves; dimensions average $5 \times 4 \times 3$ inches; shape, square oval. Gum very soft, and of a dark brown color, containing few or no remnants of poppy leaves or calyxes.

b. Karahissar—breads wrapped in poppy leaves; dimensions average $6 \times 5 \times 3$ inches; shape, oblong square. Gum stiffer than Salonica gum, and rather full of strips of leaves, stems and calyxes.

c. Balukissar—breads wrapped in poppy leaves; dimensions average $5\frac{1}{2} \times 4 \times 3\frac{1}{2}$ inches; shape, nearly square. Gum soft, and of a yellow-brown color.

d. Gheve—breads wrapped in poppy leaves; dimensions average $2 \times 3 \times \frac{3}{4}$ inches; shape, flat oval. Gum dark brown in color, and stiffer than Yerli or Salonica gum.

e. Yerli—breads wrapped in poppy leaves; dimensions average $5 \times 4 \times 2$ inches; shape, oblong square. Gum brownish-yellow and rather soft.

f. Persian — brick shaped breads wrapped in red unglazed paper, dimensions $4 \times 3 \times 2$ inches; shape, oblong square. Gum chocolate, brown in color, consistency very stiff, with a tendency to brittleness on the outer edges. Odor different from any of the other varieties, recalling slightly the odor of fruit.

g. Malatia—breads wrapped in poppy leaves; dimensions $4 \times 4 \times 2$ inches; shape, conical oval. Gum yellowish-brown in color, and about as soft as Salonica gum.

Assay.—The samples of the seven varieties of opium examined were drawn as follows: From each bread, two lumps, weighing each about ten grams, were taken, one from either end. As there were six breads on an average to a variety, this made twelve lumps, all of which were thoroughly mixed on a thick glass plate by means of a short stiff spatula until an uniform mass was obtained. The assays were made in duplicate for each variety, and the modified U. S. P. method used in all the assays.

The method is as follows: 7 grams of opium are macerated with 1.5 grams of freshly-slaked calcium oxide and 20 c.c. of water in a mortar or porcelain evaporating dish with a pestle until a uniform mixture

results. Fifty cubic centimeters of water are then added, the mixture carefully stirred and allowed to stand for an hour after covering it to avoid evaporation. It should be stirred about every ten minutes during this time. Fifty cubic centimeters are filtered off and poured into a 150 c.c. Erlenmeyer flask, washing out the measuring cylinder in which the filtrate has been collected with 5 c.c. of alcohol and then with 25 c.c. of concentrated ether and pouring both liquids into the flask. The three liquids are shaken together and one gram of ammonium chloride added. After this has dissolved, the mixture is shaken vigorously for about half an hour and set aside over night. The ether is then poured off into a double filter and 20 c.c. more of ether added to the flask and shaken with the mixture. These are again poured off into the filter, which is then washed with some pure ether to insure the complete removal of all the narcotine. After allowing all the ether to evaporate from the filter, the mixture containing the crystals of morphine is poured on the filter and all the crystals of morphine collected thereon. In order to remove the last crystals which usually adhere to the sides and bottom of the flask, it is advisable to use a piece of turkey feather, from which all the vane has been removed except a small quantity about an inch long at the end. They are then dried at 100° C., removed to a weighed watch-glass and weighed as anhydrous morphine. If it be desired to determine the amount of hydrous morphine, *i. e.* $C_{17}H_{19}NO_3+H_2O$, the above result must be multiplied by 1.065. Below are recorded the results obtained by this method, the natural gum being used in all cases:

		$C_{17}H_{19}NO_3$	$C_{17}H_{19}NO_3+H_2O$	Mean of latter.
I. Salonica opium	*a*	14.26 per cent.	15.18 percent.	15.13 per cent. morphine.
	b	14.16 per cent.	15.08 per cent.	
II. Karahissar opium	*a*	12.61 per cent.	13.42 per cent.	13.12 per cent. morphine.
	b	12.03 per cent.	12.81 per cent.	
III. Balukissar opium	*a*	11.80 per cent.	12.57 per cent.	12.59 per cent. morphine.
	b	11.84 per cent.	12.61 per cent.	
IV. Gheve opium	*a*	11.78 per cent.	12.55 per cent.	12.58 per cent. morphine.
	b	11.83 per cent.	12.60 per cent.	
V. Yerli opium	*a*	11.99 per cent.	12.73 per cent.	12.38 per cent. morphine.
	b	11.29 per cent.	12.03 per cent.	
VI. Persian opium	*a*	11.40 per cent.	12.14 per cent.	12.03 per cent. morphine.
	b	11.18 per cent.	11.92 per cent.	
VII. Malatia opium	*a*	9.83 per cent.	10.47 per cent.	10.53 per cent. morphine.
	b	9.95 per cent.	10.59 per cent.	

It might be said here that opium is usually sold by the amount of hydrated morphine it contains, which as can be seen from the figures is about one per cent. higher than the amount of anhydrous morphine. This is not however usually mentioned when the assay is given by the seller.

Although all the varieties were examined under the microscope, no decided or distinctive difference between them could be found. It was hence concluded that a microscopic examination was no criterion or means of distinguishing the varieties of opium.

Baltimore, August 2, 1893.

GELSEMIUM SEMPERVIRENS.

BY CHAS. OTIS HILL, PH. C.

Gelsemium sempervirens, Ait., of the natural order Loganiaceæ, is a native of Southern United States, where it is commonly called "yellow jessamine. It is a woody climber, overrunning trees and low bushes, and in March and April sends out flowers of a golden yellow color, which fill the air with fragrance. But to the student of pharmacy it is of interest because of the medicinal virtues of its roots.

The first chemical analysis was made by Kulloch in 1854, at which time he reported the following constituents: "Albumen, gallic acid, starch, gum, pectic acid, fatty resin, fixed oil, volatile oil, dry acrid resin, yellow coloring matter, extractive matter, lignin, gelsemine (an alkaloid), and salts of potassium, calcium, magnesium, iron, and silica."

Since that time quite full analyses of the root have been made, and the per cent. of gelsemine quite accurately determined and other constituents as gelsemine and gelseminic acid discovered. The work of Wormley in estimating the amount of gelsemine and in discovering gelseminic acid is one of the best works done on this subject. The discovery of gelseminine was not made until 1887, by Thompson.

The summary of my own work is as follows in the next few pages.

A sample of between three and four grains of the powdered drug was dried in a platinum crucible at 100° to a constant weight, and the loss of weight calculated as moisture, giving 7.48 per cent. moisture.

The same sample of drug was ignited to constant weight, and the ash, calculated to the dry drug, gave 2.26 per cent.

A sample of ten grams of the drug was placed in a continuous extraction apparatus and percolated five days with 100 c.c. of petroleum spirit, after which the solvent was distilled off and the residue weighed. Its weight was .221 gm. Of this residue .1758 gm. was soluble in absolute alcohol. This portion was of a semi-fluid consistency, greenish color and sickening odor. As it left a stain on glazed paper and was soluble in potassium hydroxide solution with formation of a soap, it is returned as fixed oil 1.9 per cent. No experiments were made with the residue from the alcohol solution nor in regard to the volatile oil which is undoubtedly present.

The powdered drug which had been extracted with petroleum spirit was dried and extracted in the same apparatus five days with ether, which had been freed from moisture and alcohol by distillation over $CaCl_2$.

The ethereal extract was evaporated to dryness, its weight noted, and its solubility in water and absolute alcohol tested; it was found to be insoluble in water and completely soluble in absolute alcohol. Potassium hydroxide solution turned it brown, dissolving it, and it was reprecipitated with acetic acid: therefore it is resinous. The ethereal extract is .5 per cent. of the drug.

The drug was then dried and extracted four days with absolute alcohol, which extracted 9.1 per cent. of the drug.

The residue from evaporation of the alcohol was treated with water, which dissolved out most of the alkaloids and the gelseminic acid and some coloring matter. The aqueous solution was made acid with hydrochloric acid and shaken out with ether. This took out the gelseminic acid, as known by the fluorescence of its aqueous solution. But as it was so mixed with coloring matter, no attempt was made to weigh it.

The solution which had been shaken out with ether while acid, was now made alkaline and shaken out with chloroform, which would remove the alkaloids, but on distilling off the chloroform, the crystals of alkaloid were so mixed with coloring matter as to make it inadvisable to weigh.

The portion of the alcoholic extract insoluble in water was shown to be principally resin, as shown by its action with potassium hydroxide, in which it dissolved with a brown color and was reprecipitated with acetic acid.

The drug dried from the absolute alcohol was next macerated two days with water and filtered. A portion of the filtrate was mixed with twice its volume of absolute alcohol and allowed to stand twenty-four hours, which gave a precipitate soluble in water, not reducing Fehling's solution, and precipitated with subacetate of lead, which indicates the presence of gum, or mucilaginous substance. No further work was done on this portion of the drug.

A portion of the powdered drug was boiled with water and filtered. The filtrate gave a blue color with iodine solution, which disappeared on heating, and which was destroyed by sodium thiosulphate solution, which indicated the presence of starch.

For the estimation of albuminoids, .627 gm. of drug was combusted and the nitrogen calculated to albuminoids. The volume of nitrogen was 10.7 c.c.; temperature was 23°; the barometric pressure was 742 mm. The calculation gave 11.7 per cent. albuminoids. The per cent. of nitrogen in the alkaloid is so small that it would make no perceptible difference in the amount of albuminoids.

From the foregoing experiments it will be seen that gelsemium sempervirens contains in addition to the alkaloids gelsemine and gelseminine,

and gelseminic acid, a volatile oil; fixed oil, 1.9 per cent.; ash, 2.26 per cent.; albuminoids, 11.7 per cent.; resin, gum and starch.

References:

M. Henry Kollock, 1854; American Journal of Pharmacy, 27, 197.

C. L. Eberle, 1868; Proceedings of the American Pharmaceutical Association, p. 386.

T. G. Wormley, M. D., 1869; American Journal of Pharmacy, 42, 1.

Dragendorff's Plant Analysis.

Prescott's Organic Analysis, pages 423–426.

COLOCYNTH, AND ITS ADULTERATION.

BY GEO. WAGNER, PH. C.

"And what is writ is writ:
Would it were worthier!"—*Byron.*

Colocynth, the fruit of Citrullus Colocynthis (N. O. Cucurbitaceæ) although used as an efficient cathartic from very ancient times, has been but very insufficiently analyzed. Researches for its active principle or principles have been made by Neissner (1), Vauquelin (2), Braconnot (3), Lebourdais (4), Herberger (5), Bastick (6), Walz (7), Hübschman (8), and Henke (9). Of these, the first five, and Hübschman do not seem to have been successful, their products in no way corresponding to the substance now usually recognized as the active principle.

Walz made the first extended report on the subject, and a very voluminous and vague one. He reports his product to be a crystalline resin, and called it Colocynthin. He gave its formula $C_{56}H_{42}O_{23}$, and claimed that on heating with sulphuric acid it broke up into Colocynthein, $C_{41}H_{32}O_{13}$ and a sugar. Walz also reported a second resin, Colocynthitin, white, crystalline, tasteless, soluble in ether but not in water.

Henke, using a process similar to though less complicated than that of Walz, obtained a resin he was unable, in attempts covering six months' work, to crystallize. He found it to reduce Fehling's solution, but doubts its breaking up with the formation of a sugar.

I prepared Colocynthin by the method, essentially, of Henke, proceeding as follows:

A ten-pound lot of the apples was freed as much as possible from seeds. It was then ground coarsely, and extracted four times: twice with water and twice with dilute alcohol. The extracts were evaporated to dryness, redissolved in water, filtered and precipitated with gallotannic acid, adding powdered pumice-stone to facilitate settling of the precipitate. This precipitate was then mixed with freshly prepared $PbCO_3$, dried on the water-bath, and finally extracted with absolute alcohol, and this extract evaporated.

The result is a brittle resin, of garnet color, breaking with a smooth fracture, odorless, very bitter. It burns easily with a smoky flame, and an

odor resembling that of burning rubber. It is heavier than water, and neutral to litmus. It is soluble in water, alcohol, and in ammonia water, insoluble in ether, chloroform, benzol, carbon disulphide, and petroleum benzin.

It reduces Fehling's solution, reduces Froehde's reagent with production of a cherry red color; and on boiling with sulphuric acid it breaks up and deposits a grey resin (10).

As to yield, Walz claims 2 per cent.; Henke, 6 per cent. But in Henke's report I was unable to make out whether he had calculated his results from the whole fruit, or from the pulp freed from seeds.

With no great attempt to be quantitative I easily obtained 25 Gm., or about 5 per cent. of the whole fruit. or 2 per cent. of the pulp.

An unsuccessful attempt was made to obtain colocynthidin. Its presence seems doubtful. A substance obtained under that name, from Merck of Darmstadt, was decidedly yellow, amorphous, and very bitter, thus corresponding in no particular to the colocynthidin of Walz.

It seems to me that not enough attention has been paid to colocynthin as a therapeutic agent. It can be prepared easily and economically, and its concentration ought to be an attractive feature. Thus far as to colocynthin.

The next matter considered was the presence of the seed in the powdered drug and the disadvantage of its presence.

75 gm. coarsely powdered seeds (the amount present in 100 gm. of the fruit) were treated according to the U. S. P. method for making the solid extract, *i. e.* macerated with dilute alcohol for 4 days, pressed out, percolated with more dilute alcohol, and the whole extract evaporated. The yield was about 5 per cent. of an extract a good deal less bitter, it seemed to me, than the extract of the pure pulp.

Then 75 gm. of the whole seeds were treated the same way, and yielded 4 per cent. of extract seemingly as bitter as that from the pulp.

So, the ground seeds yield 25 per cent. more of extract of an inferior quality than the unground. Hence their presence in a sample must certainly decrease the value of the extract made therefrom.

It *may be* that in large manufactories (where time is an object, and where residues can easily be expressed and the alcohol recovered), the extract can be made more economically, and with no defect in quality, from the whole fruit ground coarse enough to keep the seeds from being crushed. In fact Dr. Squibb reports that as his method, as early as 1867. (11). But the only practical method for the retail druggist is to follow closely the Pharmacopœia directions.

Does the retailer get the pure pulp when he buys the powdered colocynth of the market?

To find this out was my next aim. I bought five samples from 5 different retailers of this state, paying from 5 cents to 20 cents an ounce. I marked them A, B, C, D and E.

There were 2 means of detecting adulteration: 1. By determining the ash, and 2. By studying the composing tissue microscopically.

Colocynth pulp yields 11 per cent. of ash, the seeds 2½ to 3 per cent. (12). I found the powdered whole fruit to yield about 5 to 6 per cent. So a requirement of 10 per cent. of ash ought not to be too stringent. The commercial samples yielded as follows:

	per cent.		per cent.
A	5.2	D	5.8
B	3.8	E	5.0
C	9.4		

Sample B, the poorest in the lot, was the one I paid 20 cents an ounce for.

Studying the rind, pulp and seed under the microscope, the following was seen:

The rind, always present to a considerable extent, has on the outside a row of palisade cells of yellow color. This is followed by a layer of parenchyme cells, and this by a thick layer of stone cells which gradually decrease in the thickness of their walls and finally run into the large, loose parenchyme of which (with exception of some spiral vessels) the pulp is composed.

The seed shows outside, a row of palisade cells, followed by a tremendous wall of stone cells, easily divided, from the size and arrangement, into three layers. Then comes a layer seemingly of small parenchyma, but always torn up badly by the knife used in cutting sections. Finally, we have the endosperm of parenchyme cells, gradually elongated towards the inside, and completely filled with small granules of aleurone.

Even though stone cells are also present in the rind, they, with the aleurone, form the chief means of detecting the presence of seeds. And, arranging my samples according to the comparative number of these present, I found such an arrangement, except in very similar samples, to be the same as that made according to the yield of ash.

Another way of showing the presence of seeds, and one that would force the attention of even a casual observer, was tried at the suggestion of Professor Stevens.

In five test tubes of equal calibre were placed 10 gms. respectively of samples A, B, C, D, and E. Then, in a sixth tube were placed 5 gms. of pure pulp. The five gms. of pure pulp occupied more room than 10 gms. of any of the other samples.

Concluding from these samples, I judge that manufacturers made no attempt to remove the seeds before powdering. Sample C, the only comparatively pure one, I did not, from its source, consider a typical commercial one. Sample B, although it cost 20 cents an ounce, seemed to be almost all seeds, and was probably made from the sweepings of an old colocynth bin.

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PLATE I, FIG. 28. FRUIT RIND.

(*Cross-section.*)

A. Palisade cells.
B. Parenchyme.
C. Stone cells (thick-walled).
D. Stone cells (thin-walled).
E. Large parenchyme of pulp.

PLATE I, FIG. 29.

(*Tangential section.*)

A. Spiral vessel found in layer E, Fig .28.
B. Layer A, Fig. 28.
C. Layer B, Fig. 28.
D. Layer C or D, Fig. 28.

PLATE I, FIG. 30. SEED.

(*Cross-section.*)

A. Palisade cells.
B. Stone cells.
C. Torn Parenchyme.
D. } Layers of endosperm.
E. }

PLATE I, FIG. 31.

(*Tangential.*)

A. Layer A, Fig. 30.
B. Outer coat of endosperm.

FIG. 28.—FRUIT RIND.

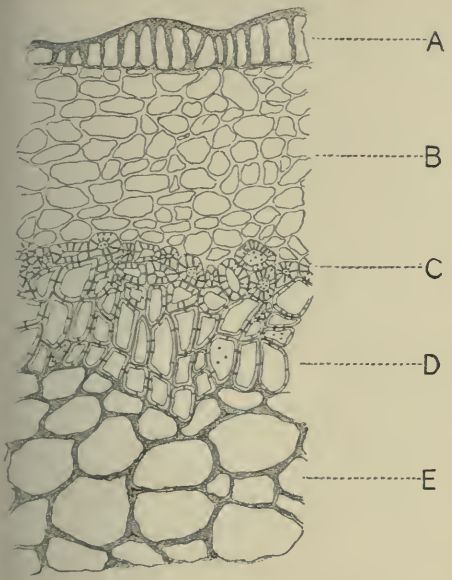


FIG. 29.—FRUIT RIND.

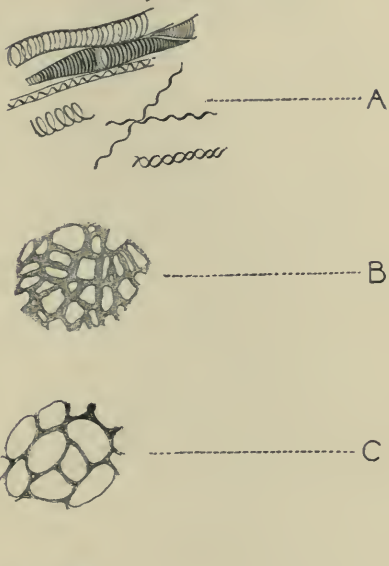


FIG. 30.—SEED.

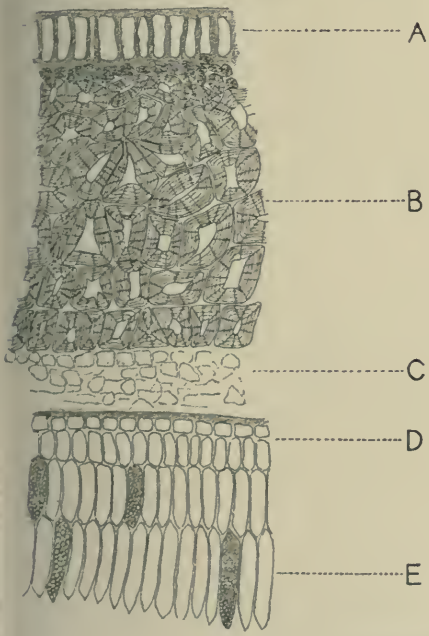
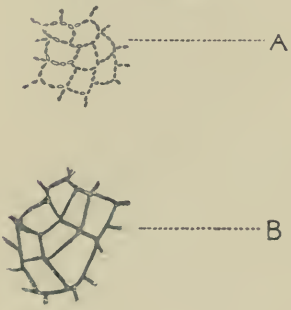


FIG 31.—SEED.



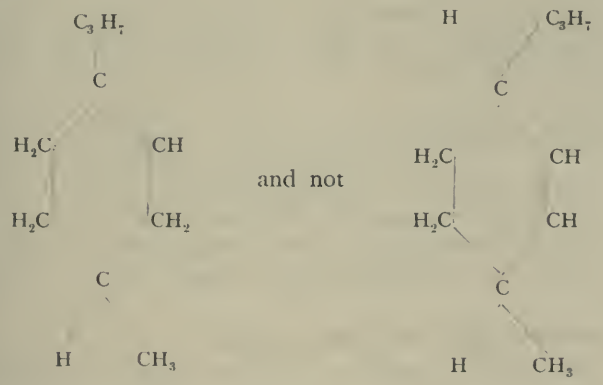
THE MENTHOL GROUP.

II.

EDWARD KREMERS AND LEO C. URBAN.

A report of the work carried on in this laboratory in connection with this subject, was published a year ago in these Proceedings. At the close of the article, attention was called to the different lines of investigation which might be pursued in connection with the crystalline derivatives there described.

During the past year we have carried on the study of these compounds, and have succeeded in the preparation of several new and interesting derivatives. The results of these investigations we have embodied in this report. The literature on the menthol group was quite thoroughly reviewed in the paper referred to; however, since then, work done by Baeyer[2] on dihydrocarveol makes it appear very probable that menthene has the structure



as has heretofore been generally assumed. The formula was first suggested by Atkinson in 1881, Chem. News, 44, p. 283, but no valid reasons were at the time assigned for the acceptance of this formula, neither have any reasons been assigned why the first formula has been preferred. In consideration of Baeyer's work we are inclined to favor his formula.

MENTHENE NITROSOCHLORIDE.

As stated in our previous paper, the yield of the nitrosochloride addition product of menthene is very much lower than the theory would require. We have as yet been unable to devise a process by which a larger percentage yield can be obtained.

The following are the quantities obtained by different experimenters from 15 c.c. of menthene by the process described:

	Average.	Largest.
Mr. Turner	3.14 g.	3.94 g.
Mr. Roberts	3.55 g.	

The average yield being therefore scarcely 20 per cent. of the theoretical quantity.

In the preparation of the nitrosochloride, the mother liquor was found to be very stable, and even after several months, crystals continued to separate. Under these conditions a study of the mother liquor appeared particularly interesting. Wallach and Otto have isolated from the mother liquor of pinene nitrosochloride pinol, $C_{10}H_{16}O$, an oxidation product of pinene, the study of which has thrown much light on the chemical properties of pinene.

An attempt was made to separate its constituents by fractional distillation under diminished pressure. This was but a partial success. It was successful inasmuch as the alcohol and esters, together with a large part of the water, could be removed. Distillation of the remaining oil, however, was impossible, since its green color gradually disappeared, and other more striking signs of decomposition became visible after the lower boiling fractions were removed. The oil thus obtained was dried over calcium chloride and analyzed with the following results (Mr. Hanf):

I. 0.3018 g. of oil yielded 0.7134 g. of CO_2 = 0.19456 g. C.
0.2896 g. of H_2O = 0.032177 g. H.

II. 0.2007 g. yielded 0.5123 g. of CO_2 = 0.13975 g. C.
0.2068g. of H_2O = 0.02297 g. H.

III. 0.3016 g. yielded 0.7094 g. of CO_2 = 0.193472 g. C.
0.2995 g. of H_2O = 0.033277 g. H.

A nitrogen estimation yielded the following:

IV. 0.2018 g. of oil yielded 10.6 c.c. N at 734 m.m. pressure and 18° C. = 0.011966 g. N.

V. 0.2796 g. of oil yielded 13 c.c. N at 742 m.m. pressure and 16° C. = 0.014784 g. N.

The estimation of halogen, according to Carius:

VI. 0.2937 g. yielded 0.0815 g. Ag Cl = .02016 Cl.

VII. 0.3140 g. yielded 0.0832 g. Ag Cl = .02062 Cl.

Calculated for	Found.						
$C_{10}H_{18}NOCl$	I.	II.	III.	IV.	V.	VI.	VII.
C — 58.96%	64.46%	69.60%	64.14%	.....	.....	.....	.....
H — 8.84%	10.66%	11.44%	11.03%	.....	.....	.....	.....
N — 6.87%	.....	.....	.....	5.92%	5.28%	.....	.....
Cl — 17.44%	.....	.....	.....	.....	.....	6.86%	6.56%

These figures show quite plainly that the oil consists largely of the nitrosochloride or a similar body. An attempt was made to recrystallize it if possible, but thus far has proved unsuccessful. We have continued the study of the oil for the mother liquor, but are not yet prepared to report the further results.

MENTHENE NITROSATE.

It has been observed that the limonenes and dipentene, which yield crystalline nitrosochlorides, are also capable of yielding crystalline nitrosates. To prepare the corresponding derivative of menthene, the same process which proved successful in the preparation of the nitrosochloride was employed, substituting an equivalent quantity of nitric acid for the hydrochloric acid.

15 c.c. of menthene were mixed with 15 c.c. of glacial acetic acid and 11 c.c. of ethyl nitrite. To this mixture a solution of 4 c.c. of nitric acid, and 6 c.c. of glacial acetic acid was gradually added, constantly shaking in a freezing mixture. After standing for about an hour, flat, cubical crystals separated out. The average yield was 3.5 g. from 15 c.c., a yield proportional to that of the nitroso-chloride obtained by the same process. After separation of the first crop of crystals, only a very little more was obtained, in the form of a fine crystalline powder. After 24 hours, the mother liquor became brown, indicating decomposition. The nitrosate was purified by redissolving it in chloroform and precipitating by means of alcohol. Its solution is very unstable, becoming brown on standing but a short time. It is soluble in hot alcohol, in about 80 parts of ether, 9 parts of chloroform and almost insoluble in petroleum ether, cold alcohol or acetic ether. When heated it assumes a light green color, sublimes, and melts at 97½°–98° C.

A 5 per cent. solution in chloroform was found to be optically inactive. Upon analysis the following results were obtained (A. L. Emde):

I. 0.2027 g. yielded ..... 0.3930 g. CO_2
" 0.1446 g. H_2O
II. 0.2316 g. yielded..... 0.4396 g. CO_2
" 0.1618 g. H_2O
III. 0.24795 g. yielded 26 c.c. N at pressure of 727 m.m. and 20.5° C. 0.02834 g. N.

	Calculated for. $C_{10}H_{18}N_2O_4$	Found. I.	II.	III.
C.	52.17 per cent.	52.38 per cent.	51.76 per cent.	
H.	7.82 "	7.92 "	7.95 "	
N.	12.1 "	....	....	11.43 per cent.

These results correspond very well with the theoretical amounts, and no doubt, as to its constitution, can exist.

It was desirable to determine whether this nitrate would yield the same derivatives as the nitrosochloride when treated in a similar manner. Both the nitroso derivative and the benzylamine base were prepared, and found to be identical in every respect.

MENTHENE NITROLBENZYLAMINE.

5 g. of menthene nitrosate were heated with 5.25 g. benzylamine and 30 c.c. of alcohol with a reflux condenser on a water bath until solution was effected. The solution was filtered and set aside in a cool place. Two crops of crystals were separated which proved to be the benzylamine base; the third crop consisted chiefly of benzylamine hydrochloride. The crystals obtained from the first two crops were recrystallized from alcohol. The melting point was found to be 106½°, corresponding to that obtained from the nitrosochloride. It was optically inactive. Its appearance, together with these characteristics, were deemed sufficient evidence of the identity of this base with that derived from the nitrosochloride.

NITROSOMENTHENE FROM THE NITROSATE.

3 grams of menthene nitrosate were heated together with 1 g. of potassa in alchoholic solution for one-half hour. The precipitate consisting of potassium nitrate was filtered off, and the filtrate poured into water. After standing in the cold for 12 hours, the crystalline precipitate was filtered off and recrystallized from benzene. It melted at 65½°–66°, and was found to be optically inactive. It had also the characteristic odor of nitrosomenthene from the nitrosochloride, and no doubt as to the identity of the two products can exist.

An attempt was also made to prepare the nitrosite of menthene according to the same process employed in the preparation of the nitrosochloride and nitrosate, using proportionate quantities of sodium nitrite and glacial acetic acid, but this, as well as the terpinene reaction of Wallach yielded negative results.

Terpenes which yield nitrosochlorides and nitrosates do not yield nitrosites. In this respect menthene again shows its relationship to the terpenes.

The study of menthene was pursued farther with the intention of preparing, if possible, several nitrolamine bases. A study of these bases seemed very inviting, on account of their close relationship to like bases prepared from the nitrosochlorides of the terpenes. We have already shown the formation of the nitrolbenzylamine menthene from the nitrosochloride, as well as from the nitrosate. The preparation of an aniline base was next undertaken.

MENTHENE NITROSOCHLORIDE AND ANILINE.

5 g. of aniline were heated together with 5 g. of menthene nitrosochloride

and 30 c.c. of alcohol on a water-bath, using a reflux condenser, until solution was effected. The deeply-colored solution was filtered, evaporated nearly to dryness, and treated with water to separate the soluble aniline hydrochloride. A blackish, oily liquid separated out, but yielded no crystals from an alcoholic solution. The experiment was repeated with a slight modification. The base was separated from the aniline hydrochloride by treatment with ether. After standing from six to eight weeks, the residue from the ethereal solution was dissolved in alcohol and poured into water. A black, oily substance separated, which was redissolved in alcohol. Upon evaporating the alcoholic solution nearly to dryness, large crystals of a golden yellow color were obtained. These were readily soluble in ether, chloroform and alcohol; sparingly soluble in petroleum ether. When recrystallized from dilute alcohol or petroleum ether, the crystals were obtained much smaller. They melted at 121½°—122° C.

Since but a very small quantity of the substance was obtained after several months of experiments, it was necessary to temporarily drop the further study of this compound. An analysis of it will be made in the immediate future, and its characteristics further investigated.

MENTHENE NITROSOCHLORIDE AND PIPERIDINE.

In attempting to prepare the piperidine base, a process similar to that used in making the aniline base was employed, but no crystalline product could be obtained.

On shaking the alcoholic solution with water, a thick oily liquid rises to the top, while the piperidine hydrochloride passes into solution. It is a light yellow, viscid liquid, of a strongly basic odor. On passing hydrochloric acid gas into the ethereal solution of this liquid, a white precipitate results which dissolves on adding an excess of the acid, then forming a heavy, dark-brown liquid, insoluble in ether. The precipitate when dried on a porous plate melts at 237°–239°, indicating the presence of piperidine hydrochloride. This was dissolved out by water, and the insoluble residue recrystallized from alcohol. This was found to melt at 66°–67°, corresponding exactly with the nitrosomenthene obtained from the nitrosochloride and nitrosate by treatment with alcoholic potassa.

The oily liquid above referred to may therefore either be the piperidine base, which, on the addition of hydrochloric acid, splits up into nitrosomenthene and piperidine according to this equation:

$$C_{10}H_{18}\begin{matrix}NO\\NC_5H_{10}\end{matrix} + HCl = C_{10}H_{17}NO + C_5H_{11}N,HCl$$

or it may simply be a mixture of the excess of piperidine employed with nitrosomenthene, the piperidine being afterwards removed as the hydrochloride, leaving the nitrosomenthene.

In the latter case it would appear that the piperidine acts towards the nitrosochloride of menthene like the fixed alkalies, splitting off hydrochloric acid with formation of nitroso-menthene in the following manner:

$$C_{10}H_{18}NOCl + C_5H_{11}N \quad C_{10}H_{17}NO + C_5H_{11}N,HCl.$$

This reaction will be further studied.

MENTHENE NITROSOCHLORIDE AND AMMONIA.

The study of this reaction is of particular interest. If ammonia acts like the fixed alkalies, the nitrosomenthene would be expected according to the following equation:

$$C_{10}H_{18}NOCl + NH_3 \quad C_{10}H_{17}NO + NH_4Cl.$$

If, however, free ammonia acts like most substituted ammonia, menthene nitrolamine would result.

Five g. of menthene nitrosochloride, and 45 c.c. of 10 per cent. alcoholic ammonia, were heated in a pressure-bottle on a water-bath until solution was effected. This required from five to six hours. By employing a saturated solution of salt as a bath, solution was effected in about an hour. The solution was filtered while hot, set aside, and allowed to evaporate. When the liquid had evaporated an amorphous mass remained. A portion of this was treated with dilute hydrochloric acid, and the residue with ether, which dissolved only a part.

Another portion was treated with water, instead of hydrochloric acid, as in the former case, and the residue treated with ether as above.

PART SOLUBLE IN HYDROCHLORIC ACID.

The acid solution was evaporated somewhat and allowed to crystallize. The crystals were separated and dried on a porous plate. On further evaporation the mother liquor yields more crystals. The crystals contained some ammonium chloride. In the process of evaporation, the mother liquor from the first crop of crystals darkened, finally becoming black and thick.

PORTION SOLUBLE IN WATER.

The aqueous solution was evaporated and set aside for crystallization. The crystals were separated, dried on a porous plate and purified in the following manner: The greater portion was soluble in alcohol, and from the alcoholic solutions the ammonium chloride was precipitated with ether. The filtrate from the ammonium chloride was set aside. In three or four days it had formed crystalline crusts composed of transparent plates. The dried crystals melted at 194°—195°C. They are freely soluble in water

and alcohol; insoluble or sparingly soluble in ether and chloroform. They evidently contain chlorine, and will be examined later.

PORTION INSOLUBLE IN HYDROCHLORIC ACID AND WATER, AND SOLUBLE IN ETHER.

That portion of the product insoluble in dilute hydrochloric acid or water was treated with ether, in which it was partly soluble. The ethereal solution was allowed to stand until all the ether had evaporated. The remaining oily liquid was dissolved in stronger ether into which dry hydrochloric acid was passed. A white granular crystalline powder was precipitated which was collected on a force filter, washed with ether and dried on a porous plate. It melts at 126°–128°. Recrystallized from hot acetic ether it formed needle-shaped crystals, which, when dried in a desiccator melted at 125°–126° C. The mother liquor when set aside showed signs of decomposition within 48 hours.

Upon analysis the crystals yielded the following results (Roberts):

I. 0.1832 g. substance gave..... 0.4016 g. CO_2 = 0.1093 C.
0.1806 g. H_2O = 0.02006 H.
II. 0.1830 g. substance gave..... 0.4026 g. CO_2 = 0.1098 C.
0.1824 g. H_2O = 0.02027 H.
III. 0.2312 g, substance gave..... 0.0343193 g. N.
IV. 0.1330 g. substance gave..... 0.0968 g. AgCl = 0.02389 Cl.

	Calculated for. $C_{10}H_{18}<^{NO}_{NH_2}HCl$	$C_{10}H_{18}>^{NH_2}_{NH_2}HCl$	$C_{10}H_{18}>^{N.NH}_{NH_2}HCl$
C.	54.44 per cent.	58.13 per cent.	54.69 per cent.
H.	9.53 "	11.14 "	10.03 "
N.	12.70 "	13.60 "	19.44 "
Cl.	16.06 "	17.23 "	16.22 "

	Found I.	II.	III.	IV.
C.	59.65 per cent.	59.99 per cent.		
H.	10.93 "	11.07 "		
N.	....	....	14.84 per cent.	
Cl.	....	....	....	17.96 per cent.

As will be seen, the figures found hardly correspond sufficiently to warrant the assumption of any of the above formulæ. We shall, however, make a number of other analyses, and the reactions of the compound will be thoroughly investigated to determine if possible its structure.

PORTION INSOLUBLE IN HYDROCHLORIC ACID, WATER AND ETHER.

After successive treatment with water (or dilute hydrochloric acid) and ether, there remained a solid crystalline compound containing halogen. The yield in various experiments differed considerably. Upon treatment

with alcoholic potassa, it was decomposed to an oily liquid. This substance has not yet been studied.

The menthene employed in the preparation of the nitrosochloride and nitrosate used in the foregoing experiments was prepared in the manner employed by Brühl. In our experiments of a year ago, we had employed acid sulphate of potassium as a dehydrating agent, but this being unavailable at the time, we were obliged to resort to the use of anhydrous sulphate of copper. The product obtained in this manner was not as highly dextrorotatory as that obtained by our method. Using acid sulphate of potassium as a dehydrating agent, we obtained, after repeated fractionation, a product having the s. g. 0.813 and turning the plane of polarization 31.85° to the right (see American Pharm. Assoc. Proceedings 1892. p. 284). Menthene prepared according to Brühl's process by two experimenters had the

s. g. 0.8163 at 20° C. $[\alpha]_D = +21.84°$ (Roberts).
s. g. 0.8130 at 20° C. $[\alpha]_D = +22.05°$ (Emde).

NITROSOMENTHENE.

This was prepared as directed in the American Pharmaceutical Association Proceedings 1892, p. 286. The largest yield obtained from 10 grams of nitrosochloride was 6.94 g., while the average yield was 5.47 g. from the same quantity, or about 87 per cent. of the theoretical yield. When recrystallized from a dilute alcoholic solution, it separated in long, flat, transparent prisms, having a peculiar, characteristic odor. It melts at 65° C. The statement made *with reserve* a year ago, in regard to its optical activity, evidently is erroneous. The pure product is optically inactive. Nitrosomenthene is insoluble in water, but soluble in cold alcohol, ether and benzene, and is very readily soluble in hot alcohol.

It is sparingly soluble in a hot aqueous solution of potassium hydroxide, from which it crystallizes on cooling. The crystals obtained from such a solution melt at 58°C., 7° lower than the pure product obtained from dilute alcohol.

When heated with acetic anhydride and upon dilution of the solution with water, an oily liquid separated, which had a disagreeable nitrile odor. The partial solubility in hot solution of potassium hydroxide and the nitrile reaction seem to indicate that there may possibly be an oxime group in the compound, or that the nitroso group can be converted into the former.

Recently Wallach[3] has prepared an oxime, dihydrocarvoxime, by the action of hydroxylamine on dihydrocarvon, which he obtained by the oxidation of dihydrocarveol, the dihydrocarveol being prepared by the reduction of carvol by means of metallic sodium. This is, however, quite differ-

ent from the nitrosomenthene, as a comparison of the melting points o the two will show:

	Active.	Inactive.
Dihydrocarvoxime	88°—89°	115°—116°
Nitrosomenthene	———	66°— 67°

MENTHYLAMINE NITRATE.

This was prepared by the reduction of nitrosomenthene in an analogous manner to that employed by Wallach in the preparation of pinylamine nitrate.

10 grams of nitrosomenthene were dissolved in 70 c.c. of glacial acetic acid with the aid of a gentle heat. When cool, water was added until turbidity set in, then zinc dust in small quantities. After the evolution of hydrogen, which was quite violent at first, had subsided, it was again diluted with water and heated on a water-bath for several hours, the flask being connected with a reflux condenser. Zinc dust should be present in excess. The liquid was then filtered off, and the zinc residue washed with warm water. The zinc was then precipitated from the solution by passing hydrogen sulphide into it while hot. The filtrate from the zinc sulphide was then concentrated on a water-bath until it became darkened in color. It was filtered again, and upon the addition of a hot concentrated solution of sodium nitrate, the menthylamine nitrate separated in a thick mass of needle-shaped crystals. These were removed from the mother liquor and dried on a porous plate.

30 grams of nitrosomenthene yielded 19.7 g. of menthylamine nitrate, which is about 47 per cent. of the theoretical yield. Menthylamine nitrate may be crystallized from benzene, from which it separates in a white, granular powder. It melts at 172° C. It is very readily soluble in water and alcohol, also soluble in ether, benzene and chloroform; insoluble in petroleum benzin.

Upon analysis it yielded the following results (Turner):

I. 0.2012 g. gave 0.3814 g. CO_2 = 0.1040 g. C.
0.1678 g. H_2O = 0.0186 g. H.

II. 0.2000 g. gave 0.3820 g. CO_2 = 0.1041 g. C.
0.1692 g. H_2O = 0.0188 g. H.

III. 0.1998 g. gave 24.3 c.c. N. under a barometric pressure of 723 mm. at 19° C. = 0.026506 g. N.

IV. 0.2118 g. gave 23.5 c.c. N. under a barometric pressure of 741 mm. at 17° C. = 0.026782 g. N.

Calculated for		Found.			
$C_{10}H_{17}NH_2HNO_3H_2O$	$C_{10}H_{19}NH_2HNO_3H_2O$	I.	II.	III.	IV.
C. 51.28 p. c.	C. 50.85 p. c.	51.70 p. c.	52.09 p. c.	.....	.....
H. 9.33 p. c.	H. 10.16 p. c.	9.14 p. c.	9.40 p. c.	.....	.....
N. 11.86 p. c.	N. 11.44 p. c.			13.26 p. c.	12.64 p. c.

Although the figures found correspond more closely with the first formula, *i. e.* the unsaturated compound, we are inclined to believe the compound a saturated one, as from its mode of preparation such a one might reasonably be expected. The excess of carbon is probably due to the fact that the salt was crystallized from benzene and may have retained small quantities of the mother liquid. Menthylamine nitrate is optically inactive.

Thiele[4] found that by boiling $C_2H_6N_6,NO_3H$ with water, ammonium nitrate split off and the elements of water were added, forming azodiazocarbonamid $C_2H_4N_4O_2$. If menthylamine nitrate acted in a similar manner, the following reaction would take place:

$$C_{10}H_{19}NH_2,HNO_3+H_2O \quad C_{10}H_{19}OH+NH_4NO_3.$$

A portion of the salt was therefore boiled in aqueous solution and the solution evaporated to dryness. The residue was taken up with ether, and upon evaporation a substance was obtained which had the same melting point as the original compound, showing that no change had taken place. This agrees with the statement of Wallach[5], that menthylamine hydrochlorate will not split off ammonium chloride when heated by itself.

MENTHYLAMINE.

This was obtained from menthylamine nitrate by treating a concentrated aqueous solution of the salt with caustic soda. An oily liquid separated, which was removed by shaking with ether. The ethereal solution was then distilled in a partial vacuum, the product distilling at 95° C. under 30 mm. pressure. Upon redistillation with potassium hydroxide a perfectly clear, oily liquid was obtained, which distilled at 85° C. under a pressure of 8 to 10 mm.

Menthylamine is an oily, colorless liquid, having a strong, basic odor. It is sparingly soluble in water, but readily soluble in alcohol and ether. It boils at 85° C. under a pressure of 10 m.m. On exposure to air it absorbs carbon dioxide readily, and is converted into the carbonate, a white crystalline powder. Upon analysis, it yielded the following results (Turner):

I. 0.1740 g. gave 0.4944 g. CO_2 = 0.1348 g. C.
0.2034 g. H_2O = 0.0226 g. H.
II. 0.1754 g. gave 0.4988 g. CO_2 = 0.1360 g. C.
0.2024 g. H_2O = 0.0225 g. H.
III. 0.151 g. gave 14.8 c.c. N, under a barometric pressure of 727 mm. at 23° C. 0.015828 g. N.

Calculated for		Found.		
$C_{10}H_{17}NH_2$	$C_{10}H_{19}NH_2$	I.	II.	III.
C. 78.43 per cent.	77.42 per cent.	77.49 per cent.	77.53 per cent.	....
H. 12.42 "	13.54 "	12.98 "	12.83 "	....
N. 9.15 "	9.03 "	....	....	10.48 per cent.

The sp. g. of a five per cent. ethereal solution of menthylamine was .7435, the s. g. of the ether used being 0.7378, which would give menthylamine an approximate s. g. of 0.8518.

A portion of menthylamine was dissolved in acetic acid and sodium nitrite added. A slow reaction occurred, with the separation of an oily liquid. The solution was then made slightly alkaline with sodium hydroxide and distilled with steam. The oily liquid which distilled over had an odor of menthol which became more distinct upon boiling with sulphuric acid. Menthol could not be crystallized out on cooling.

This reaction suggests an interesting line of further investigation; the formation of menthol or an isomer of menthol being probable. From the insolubility of the oily liquid formed, an intermediate diazo-compound may be suspected, although the compound being more probably a saturated compound, it would be expected to react with nitrous acid like the fatty compounds, forming the hydroxy-derivative without a stable intermediate product.

MENTHYLAMINE HYDROCHLORATE.

This was prepared in a manner analogous to that given for the preparation of the nitrate by precipitating with sodium chloride instead of sodium nitrate.

The hydrochlorate crystallizes in white, crystalline scales which melt at 205° C. When made in this way the yield is very small, being only about 20 per cent. of the theoretical yield. It was also prepared by passing hydrochloric acid gas into an ethereal solution of menthylamine. Washed ether was used, which on treatment with the gas separated into two layers, an aqueous and an ethereal layer, both of which yielded menthylamine hydrochlorate upon evaporation. That obtained from the aqueous layer melted at 198°C, and that from the ethereal solution at 197°C.

Menthylamine hydrochlorate crystallizes from ether as a white crystalline powder, readily soluble in water, alcohol, chloroform and benzene.

A chlorine estimation, according to Carius, resulted as follows (Turner):

0.1940 g. yielded 0.1490 g. Ag Cl = 0.0368 g. Cl.

Calculated for	Found.
$C_{10}H_{19}NH_2HCl$	I.
Cl = 18.54 per cent.	19.01 per cent.

On treating a solution of menthylamine hydrochlorate with platinic chloride, a double chloride separated in the form of yellow crystalline scales which were sparingly soluble in water, but readily soluble in alcohol.

From the results obtained in the analysis of menthylamine it will be seen that there are two possible formulas which might be assigned to it, viz.: $C_{10}H_{17}NH_2$, an unsaturated compound, and $C_{10}H_{19}NH_2$, a saturated com-

pound. As stated under menthylamine nitrate, the formation of an unsaturated compound is not very likely, as its mode of preparation is such that a saturated compound may be expected ;[6] for this reason the latter may be assumed until it is affirmed or disproved. The reaction which takes place when it is treated with nitrous acid, whereby a menthol odor is produced, also points to the same formula.[7] This reaction is analogous to that afforded by fencholamine $C_{10}H_{17}NH_2$, fencholic alcohol being produced.[8] The menthylamine obtained by the reduction of nitrosomenthene, corresponds very closely to that obtained by Wallach by the action of ammonium formate or menthone,[5] and also in some respects to that of Andres by the reduction of mentho-oxime by means of sodium.[9]

Method of Formation.	Boiling Point.	Specific gravity.	Optical activity.	Date.
By reduction of nitro-compound obtained by the action of HNO_3 on Menthol[11]	185°–190°	.....	inactive.	1881
By the action of ammonium formate on menthone[5]	208°–209°	0.862	dextrorotatory.	1890
By reduction of mentho-oxime[12, 13]	204°	0.8685	$[\alpha]_D$ —33.6°	1892
	206°–207°	.....	$[\alpha]_D$ — 9.21°	1892
By the reduction of nitrosomenthene	85° C. at about 10 mm. pressure.	0.8518	inactive.	1893

The melting point of the hydrochlorate obtained by the reduction of menthoxime by Andres, had not melted at 280°, that of Wallach by the action of ammonium formate on menthone melted at 189°, while that obtained by us from nitrosomenthene melted at 205° C.

The menthylamine obtained by us is probably identical with the inactive variety of that obtained from menthone and ammonium formate.[10]

REGENERATION OF MENTHOL FROM MENTHENE.[14]

Menthene was allowed to stand in contact with glacial acetic acid for six weeks. At the end of this time, the ester formed was saponified with alcoholic potassa, and distilled with water vapor. The distillate had a strong odor of menthol, and upon cooling, menthol crystallized out. The experiment was repeated in the following manner with negative results.

Menthene was fractionated several times, and fraction 164°–165° (at about 730 mm. pressure, s. g. .8130 at 20° C. $[\alpha]_D$ 22.05°). This was digested for seven hours with glacial acetic acid, and the excess of acid then separated by water, and the oily layer distilled with steam. One-half of the yellow liquid was digested with moist silver oxide, and the other part with alcoholic potassa and distilled with steam. In each case, upon fractionating, the largest fraction distilled over at 164°–167°—the rotatory power of the former being $[\alpha]_D$ +23.51°, and the latter $[\alpha]_D$ +24.1°.

A small portion remained behind in the bulb, which had a strong menthol odor, but no crystals could be separated from it on exposure to a freezing mixture. We shall attempt the preparation of larger quantities of the menthol according to the method used in our first experiment. The menthol separated was laevorotatory.

References and Notes.

[1] Proceedings Amer. Pharm. Ass., 1892, p. 273.

[2] Berichte, Vol. 26, p. 824.

[3] Annalen, Vol. 275, p. 116.

[4] Annalen, Vol. 267, p. 7.

[5] Berichte, Vol. 24, p. 3992.

[6] Compare dihydrocarveol resulting from the reduction of carvol by Lenckart in Berichte, and Wallach in Annalen.[3] Also the reduction of dihydrocarveol to tetra hydrocarveol by means of zinc dust and acetic acid by Baeyer.[2]

[7] The tetra hydrocarveol, the other secondary alcohol of this composition according to Baeyer,[2] has an orange flower odor. The odor of the tertiary alcohol is not known, but may be presumed to be different, possibly phenol-like.

[8] Annalen, Vol. 269, pp. 369–376. and Journal Chem. Soc., Vol. 62, p. 1240.

[9] Berichte, Vol. 25, pp. 609–621, also Journal Chem. Soc., Vol. 62, p. 723.

[10] When menthylamine is prepared by the action of ammomium formate on menthone, small quantities of a lævorotatory variety are formed at the same time, whose properties are identical with that obtained by the reduction of menthoxime. Wallach, Berichte, Vol. 25, p. 3315.

[11] Moriya, Journal Chem. Soc., Vol. 39, p. 77.

[12] Andres and Andraeef, Berichte, Vol. 25, p. 604.

[13] Negoworoff, Ibidem, Vol. 25, Ref. p. 162.

[14] Proceedings Amer. Pharm. Ass., 1892, p. 279, Note 25. "Berkenkeim (Berichte Vol. 25, p. 686) has obtained an isomer of menthol by the reduction of terpin hydrate with hydriodic acid, forming an analogue of menthyl iodide, which he converted into the acetic ester by means of silver acetate, and then saponified. The alcohol formed had a strong mint-like odor, but was liquid. He obtained a similar product upon saponification of menthyl acetate."

ASEPTIC IRRIGATING TUBE.

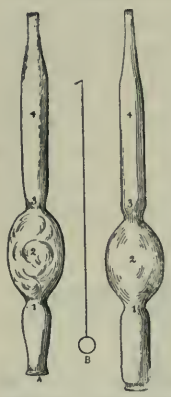
BY ADOLPH LEVY.

To insure thorough safety when using an irrigator, the writer constructed a device for straining solutions when passing through sometimes 20 to 30 feet of rubber tubing, generally at a temperature of from 80° to 120° F.

New tubing is more likely to yield to hot antiseptic (chemical solutions) than tubing which has been in use for some time, and the white (ordinary) heavy tubing, more than Para tubing of light weight. It has also been experienced in cases where solutions of salicylic, boric and carbolic acids have been employed, and where the tubing has not been cleansed,

that the following day, upon passing through it hot distilled water, a precipitate gathered on the filter which was objectionable to a procedure where thorough cleanliness is of vital importance. Ordinary bulb syringes, occasionally used for irrigators, are subject to the same faults, perhaps, than the fountain style of douches. It is due to these facts that this irrigation and filtering tube was constructed.

FIG. 32.



Aseptic Irrigating Tube.

The material used for filtering is lambs' wool, washed with ether, to free it from oil, and dried. The ordinary lambs' wool purified will answer the purpose very well. The well-annealed smooth glass tube can be thoroughly boiled, and, therefore, be accepted as a thoroughly sterilizable irrigation appliance.

A—Flange or collar to connect tubing.

2.—Chamber containing filtering material.

3.—Constriction in tube to prevent filtering material from slipping into the lower portion of tube.

4.—Conical, partly tapering, and useful if necessary to connect catheters.

B.—Introducer and extractor for filtering material, made of wire. Length of tubes 4, 5 and 6 inches.

ON ABIETIC ACID.

BY J. L. MEAD AND EDWARD KREMERS.

REVIEW OF CHEMICAL LITERATURE.

The members of the natural order Coniferae have the common property of emitting under certain circumstances a resinous exudation. Some members afford such an exudation so abundantly that they are sources of important articles of commerce. These natural products are commonly known as turpentines or gum turpentines, "terebinthinæ" of the Pharmacopœias. These are the more or less solid exudations of members of the genus Pinus, in Europe the Pinus sylvestris (L.) and P. maritima (P.), and in this country, the Pinus taeda (L.), and P. palustris (Mill.) of our South Atlantic States. These turpentines when subjected to distillation yield the well-known "spirits of turpentine."[1] The residue remaining in the still has received, in common language, the names rosin and colophony.[2]

This latter substance has from time to time attracted the attention of investigators, but with no concordant results.

As resin acids, conjectured to be the same, had been obtained in this laboratory during last year from the products of three different Coniferæ,[3] viz., from black pitch from Pinus taeda (L.) and P. palustris (Mill.) balsam of fir from Abies balsamea (Mill.) and Burgundy pitch from Abies

excelsa (DeC.), the problem was suggested as to the occurrence of this acid in commercial rosin and its preparation therefrom, more abundantly and in a purer state than heretofore, together with the investigation of some of its properties.

Before proceeding to the discussion of the results of laboratory work, it will be well to review the work done by others along this line, and most conveniently in the form of short monographic paragraphs on the work of each investigator.

Unverdorben[4] appears to have been the first of whose work we have record. Though unable to examine the original article, he appears to have obtained from the colophony of Pinus sylvestris a crystallizable acid melting at 152.5° C(122°R.) which was termed "sylvic" acid, and an amorphous residue possessing acid properties, to which the name "pinic" acid was given. Berzelius called them respectively β-resin and α-resin of colophony.[5]

In 1834–35, H. Rose[6] continued the examination of colophony by Unverdorben. His results led him to assign the formula $C_{20}H_{32}O_2$ to the acid. The precipitated salts of lead and silver contained an excess of the base. The amorphous residue gave substantially the same reactions as the crystals.

At the same time Tromsdorff,[7], [8] not being able to obtain always the two acids as Rose, prepared what he termed sylvic acid by fractional precipitation of an alcoholic solution of colophony with hot water, and by recrystallization from alcohol in the presence of a little sulphuric acid. His analytical results agree very well with the formula $C_{20}H_{30}O_2$. The amorphous residue[9] was found to contain more oxygen, and to correspond closely to $C_{40}H_{58}O_7$ in composition. (This probably applies to Rose also.)

Liebig[10] reviewed Tromsdorff's work, analyzing a "beautiful crystalline" acid presented to him by Tromsdorff, and which he calls "pinic" acid. He came to the same conclusion regarding its formula.

In 1840 Aug. Laurent[11] published the results of the examination of two specimens of colophony. The origin of one specimen, Bordeaux colophony, he was enabled to trace to Pinus maritima (P.), while about the other nothing more was known beyond that it was found in a Paris drug house. From the first he separated two quite distinct isomeric acids, to one of which he applied the name pimaric, melting point 125° C. From the second colophony only one acid, abietic (?), was obtained, which had the melting point 149° C.(?). His pimaric acid separated in crusts or crystalline powder, which under the microscope was seen to consist of thin right-angled triangular crystals.[12]

Sievert's[13] pimaric acid crystallized in laminæ supposed to be derived from a quadratic prism, and melted at 155° C. His sylvic acid crystals were triclinic prisms. The acid melted at 150°–155° C.

In 1864, R. Maly[14] obtained in an examination of an American colo-

phony but one acid, which was very stable, and which after repeated crystallizations, melted at about 165° C. His analyses of the acid and a large number of its salts led him to assign to it the formula $C_{44}H_{64}O_5$. The acid was prepared with diluted alcohol. He also ascertained that colophony took up in the process of crystallization about 3.5 per cent. of water. The acid separated in two forms, viz.: as nodular crusts, and as a crystalline mealy powder. Colophony, according to him, is the anhydride of this abietic acid. He also concludes that the resinous exudations contain this anhydride in solution in the volatile oil[15].

J. Duvernoy[16] four years later obtained by fractional treatment with alcohol an acid from galipot or pitch of European pines.[17] It separated in nodular crusts of right-angled triangles. It melted at 149° C., and agreed best in composition with the formula $C_{20}H_{30}O_2$. It is lævogyrate. He considered it to be pimaric acid.[18] When distilled it yielded an acid which melted at 125° C., and which also corresponded in other respects to sylvic acid obtained from colophony.

In 1874, A. Caillot[19] separated from the resin of European turpentine with the aid of 85 per cent. alcohol, an acid melting at 125° C., and otherwise corresponding to Laurent's pimaric acid. By repeated crystallizations, however, he was enabled to separate it into two isomeric acids, one melting at 208° C., and dextrogyrate, $\alpha = +18.6°$, the other melting at 153° C., and strongly lævogyrate $\alpha = -66°$. The crystalline form is given as eight-angled and triangular respectively.

In 1879, O. Emmerling[20] obtained a resin acid from colophony, which crystallized from acetic acid, melted at 139° C., and which he identified as the abietic acid of Maly.

Later in this same year, W. Kelbe[21] reported concerning an acid obtained from the soda-lye used in purifying rosin oil, that it corresponded well with Maly's abietic acid, $C_{44}H_{64}O_5$, melting at about 165° C., and crystallizing in flat prisms, which were considered as belonging to the triclinic system.

In 1884, C. Leibermann[22] investigated abietic, sylvic and pimaric acids, coming to the conclusion that abietic and sylvic acids differ only as regards purity, while the isomeric pimaric acid is different, as indicated by the rotatory power. He prefers a molecule of twenty carbon atoms, especially for the hydrocarbons derived therefrom.

S. Haller[23] followed Liebermann very closely both as to time and to manner of work, coming to about the same conclusions. His pimaric acid separated from a mixture of alcohol and water, as a crystalline mass, melting at 149° C., and was optically inactive. The sylvic acid separated as three-sided leaflets, melting at 161°–162° C., and was lævogyrate, $[\alpha]_D - 53°$.

About this same time L. Valente[24] obtained from colophony through the agency of alcohol and water an acid in the form of prisms which melted at

about 160° C., and which agreed equally with $C_{41}H_{64}O_5$ and $C_{20}H_{30}O_2$ in composition. When purified by treatment with sodium carbonate solution and sulphuric acid and crystallized from alcohol, it melted at 148°–149° C. and corresponded in composition very closely to $C_{20}H_{30}O_2$. It is optically active, $[\alpha]_D = +37.87°$.[25]

In 1886–87, A. Vesterberg[26] published the results of an examination of galipot, the source of European colophony, showing the existence of two acids, possessing decided characteristics, which were easily separated by means of their sodium salts, and a third acid with less marked properties, One of the two he termed dextropimaric acid.[27] This melts at 210°–211° C, crystallizes in tabular forms belonging to the rhombic system, and is dextrogyrate $[\alpha]_D = +72.5°$. The other was called laevopimaric acid.[28] The melting point is 140°–150°, crystal form, rhombic sphenoidal hemihedral prisms. It is very strongly laevogyrate, $[\alpha]_D = -272.°$ It first separates as nodular crusts or a crystal meal of variable melting point. To these acids he gives the formula $C_{20}H_{30}O_2$.

In 1890 Bischoff and Nashvogel[29] obtained a dextrogyrate acid, $C_{20}H_{30}O_2$ $[\alpha]_D = +63$, from colophony by distillation, which they termed "isosylvic" acid, and which melted at 60.5°–62.5° C.

From the preceding statements it will be seen that much of the confusion in regard to the constituents of colophony, and incidentally of the related balsams, arises from insufficient consideration of the source, also the variation of the methods of preparation. That these two factors, especially the first, were of considerable importance, was early recognized. Still they have been neglected to a great extent, and have given rise to the confusion indicated above. Within the last decade or two, more care has been manifested, and as a result the contributions appear to have a more permanent value than many in the past.

The present condition of the subject points to the existence of the two pimaric acids found in European Coniferæ and another acid (some claim two) occurring most largely in the American Coniferæ, the occurrence and properties of which have not as yet been as thoroughly studied as have those of the pimaric acids. This acid (or acids) has been known as abietic or sylvic acid according to the author describing it. The determination of what acid or acids were obtained by each investigator, is very uncertain. Unverdorben, Rose and Tromsdorff evidently had the same acid. The pimaric acids, mixed or isolated, were probably examined by Laurent, Sievert, Duvernoy, Caillot, Liebermann, Haller and Vesterberg. Maly, Kelbe, Lieberman and Haller, probably Sievert and Emmerling, and possibly Laurent and Duvernoy, had abietic acid, or a mixture containing it as chief constituent. The abietic acid of Valente and the isosylvic acid of Bischoff are anomalies.

TABULATED RESULTS.

Investigator.	Source.	Acid.	Melting Point.	Rotatory Power.	Composition.	Form.	Menstruum.
Unverdorben ..	Colophony of P. sylvestris	Sylvic.	152.5°	.....	.....	Crystalline.	Dil. alcohol 60 per cent. and 80 per cent.
		Pinic.	.....	.....	.....	Amorphous.	
Rose, 1834–35 .	As above.	Sylvic.	Probably 152.8°	.....	$C_{20}H_{32}O_2$	Crystalline.	Same.
		Pinic.	.....	.....	.....	Amorphous.	
Tromsdorff, 1834–35.	Probably same as above ..	Sylvic.	152.5°	.....	$C_{20}H_{30}O_2$	Crystalline.	Alcohol, water and sulphuric acid.
		Oxysylvic.	.....	.....	$C_{40}H_{58}O_7$	Amorphous.	
Laurent, 1840	[1]Colophony of P. maritima.	Pimaric.	125°	.....	$C_{20}H_{30}O_2$	Right-angled triang es.	Alcohol.
		Pyromaric.	125°	.....	$C_{20}H_{30}O_2$	Triangular, tabular.	Fractional solution.
	[2](?)Colophony.	Abietic?	149°?	.....	$C_{20}H_{30}O_7$?	.....	Fractional solution.
Sievert, 1859...	.....	Pimaric.	155°	.....	.....	Laminæ from quadratic prisms.	
		Sylvic.	150°–155°	.....	.....	Triclinic prisms.	
Maly, 1864	Am. Colophony.	Abietic.	165°	.....	$C_{44}H_{61}O_5$	Nodular crusts or mealy powder.	Alcohol, 70 per cent.*
Duvernoy, 1868	[1]Galipot from P. maritina and P. sylvestris.?	Pimaric.	149°	Lævogyrate	$C_{20}H_{30}O_2$	Nodular crusts of right-angled triangles.	Alcohol. Fractional solution.
	[2](?)Colophony.	Sylvic.	129°	.....	.....	.....	Fractional solution.
Caillot, 1874...	Fr. Turpentine.	Pimaric.	125°	Lævogyrate.	.....	Crystalline.	Alcohol, 85 per cent.
	Probably entirely from P. maritima	d–pimaric.	208°	+18.6°	$C_{20}H_{30}O_2$	Eight-angled.	Fractional crystallization.
		l–pimaric.	153°	—66°	$C_{20}H_{30}O_2$	Triangular.	
Emmerling, 1879	(?)Colophony.	Abietic.	139°	.....	$C_{44}H_{64}O_5$	"Like-sided" triangular.	Alcohol, 70 per cent.†
Kelbe, 1879 ...	Rosin oil.	Abietic.	165°	.....	$C_{44}H_{64}O_5$	Flat triclinic prisms.	Soda lye and acetic acid.
Liebermann, 1883–84.	(?)Colophony.	Sylvic. Abietic. Pimaric.	.....	Different.	$C_{20}H_{30}O_2$		
Haller, 1884...	Uncertain.	Pimaric.	149°	$[a]_D = \pm 0$	$C_{20}H_{30}O_2$	Crystalline powder.	Alcohol and water, recrystallized after treatment with soda.
		Sylvic.	161°–162°	$[a]_D = -53$	$C_{20}H_{30}O_2$	Three-sided leaflets.	
Valente, 1884..	(?)Colophony.	Abietic.	160°	.....	Variable.	Prismatic.	Alcohol and water, purified by caustic soda, and sulphuric acid.
			149°	$[a]_D = +37.87°$	$C_{20}H_{30}O_2$	Probably unchanged.	
Vesterberg, 1886–87.....	Galipot.	d–pimaric.	210°–211°	$[a]_D = +72.5$	$C_{20}H_{30}O_2$	Rhombic tabular.	Fractional treatment with alcohol, separated by caustic soda & ether.
	P. maritima.	l–pimaric.	140°–150°	$[a]_D = -272°$		Hemihedral rhombic prismatic.	
Bischoff.	(?)Colophony.	Isosylvic.	60.5°–62.5°	$[a]_D = +63$	$C_{20}H_{30}O_2$	.....	Distillation.

* Recrystallization with sulphuric acid.

† Recrystallization after sodium carbonate and sulphuric acid.

EXPERIMENTAL PART.

As has been stated, the object of the following course of laboratory work was the preparation and identification of the crystalline compound to be derived from the common rosin of American markets and its correlation to crystalline resin acids already obtained, particularly those obtained in this laboratory.

After the preliminary experiments[30] it was decided to use the method employed by Unverdorben in the experiments first made, with but slight modifications, and also the method heretofore used in this laboratory through the precipitated lead salt. In these operations 1.5 and 1.0 kilos of rosin, respectively, were worked up. From neither of these methods quantitative results can be given, as the crystalline portion is still separating in both cases.

PREPARATION BY MEANS OF THE LEAD SALT.

To a solution of 1000 grams of rosin in alcohol a hot alcoholic solution of 630 grams of lead acetate was added. The resulting amorphous precipitate was collected and washed with alcohol. It formed a white, pulverulent mass, odorless and tasteless. On analysis 2.0912 grms. of the salt yielded 0.7518 grms. of $PbSO_4$ containing 0.4784 grms. lead, corresponding to 22.88 per cent. According to the formula $Pb(C_{20}H_{29}O_2)_2$, the yield should be 25.49 per cent. of lead. The mother liquor upon standing, separated several crops of precipitate which became at last decidedly crystalline. The united separations amounted to between 1200 and 1300 grammes, besides a quantity of apparently amorphous residue. The precipitate was decomposed by hydrogen sulphide while suspended in hot alcohol; the lead sulphide[31] was filtered off, the filtrate freed from hydrogen sulphide by evaporation and set aside for crystallization.[34] The crystals that separated were recrystallized from alcohol. The form of the crystals, manner of separating and behavior of melting point indicated identity of these crystals with those obtained according to the following method.

PREPARATION OF ACID ACCORDING TO UNVERDORBEN'S METHOD.

According to this method, which gave by far the better results, the powdered rosin was covered with 70 per cent. alcohol and allowed to stand until completely converted into a whitish crystalline mass. After thoroughly removing the contaminated alcohol, this magma was dissolved in hot, strong alcohol, 92–93 per cent., and the solution set aside in the cold to crystallize. As this did not occur readily, a small quantity of water was added, when crystals began to separate. Part of the dishes first separated the nodular crusts of the so-called sylvic acid in greater or less abundance, while others immediately separated the compound designated as abietic acid, *i. e.* a mass of fine meal-like crystals, very readily soluble in alcohol and with difficulty freed from the mother liquor, which was then again set aside, and from which at intervals of from one to two weeks sim-

ilar crops of crystals have been obtained.[32] Upon recrystallization all distinction between the "crust" acid and the "mealy" acid was gradually lost, so that only one series of experiments will be given, viz., those with that acid obtained after six crystallizations from alcohol and one from ether, followed by prolonged drying over calcium chloride.

MELTING POINT.

The melting point, which was repeatedly taken during the process of purification, is not a satisfactory constant. The acid melts during a rise of eight to ten degrees. For the powdered crystals obtained as above stated, the following series of melting points[33] was determined, viz. 154°, 155°, 155.5°, 152.5°, and 156° C. Under the same conditions, these crystals recrystallized from alcohol, melted at 149°–150°, after being thoroughly drained and dried over calcium chloride two days.

CRYSTAL FORM.

In form the individual crystals are seen to be thin triangular plates. The larger angle of the broad face appears to the naked eye like a right angle. The other angles in the cases roughly examined under a microscope with a revolving stage appear to be about equal, *i. e.* approximately 45° each. Usually only one of the acute corners of these crystals can be seen, which then appear as flat plates, the edges of which are planes oblique to the larger faces. Ordinarily also these crystals tend to form rosettes or stellate groups. This is the form in which it separates from benzene solution in particularly pretty groups.

Special attention has been given to the cultivation of crystals whose faces were suited for measurement of angles, but without decisive results as yet.[35] The crystals are transparent, white, or very slightly tinged with yellow, odorless, tasteless and very brittle.

COMPOSITION.

In ascertaining the empirical composition of the acid, the combustions were made with lead chromate in a current of oxygen. They gave the following results:

I. 0.2272 g. of the acid yielded 0.6674 g. CO_2 = 0.1812 g. C.
and 0.2150 g. H_2O = 0.02388 g. H.

II. 0.1767 g. of the acid yielded 0.5152 g. CO_2 = 0.1405 g. C.
and 0.1752 g. H_2O = 0.01946 g. H.

III. 0.2771 g. of the acid yielded 0.8065 g. CO_2 = 0.2199 g. C.
and 0.2540 g. H_2O = 0.02822 g. H.

IV. 0.1486 g. of the acid yielded 0.4319 g. CO_2 = 0.1178 g. C.
and 0.1360 g. H_2O = 0.01511 g. H.

Calculated for		
$C_{20}H_{30}O_2$ (of Tromsdorff)	$C_{44}H_{64}O_5$ (of Maly)	$C_{20}H_{32}O_2$ (of Rose)
C. 79.47 per cent.	78.57 per cent.	78.94 per cent.
H. 9.93 per cent.	9.52 per cent.	10.53 per cent.
O. 10.59 per cent.	11.91 per cent.	10.53 per cent.

Found	I.	II.	III.	IV.	Average.
C	79.74	79.83	79.37	79.26	79.55 per cent.
H	10.51	10.99	10.14	10.16	10.45 per cent.

It can be seen at a glance that the formula $C_{20}H_{30}O_2$ agrees best with the results of the above analysis. The results of analyses III. and IV. agree particularly well with the requirements of the formula. This formula was first given by Tromsdorff to sylvic acid[7], and has within recnt years been assigned by Vesterberg[26] to the pimaric acids.

MOLECULAR WEIGHT.

The question now arose whether the formula was $C_{20}H_{30}O_2$, or a multiple of this, *e. g.*, $C_{40}H_{60}O_4$, bringing it nearer the more generally accepted formula of Maly, $C_{44}H_{64}O_5$. The acid is not volatile except at high temperatures, when decomposition takes place to a greater or less extent. Its molecular weight, therefore, could not be determined by means of its vapor density. Hence Raoult's method was employed, using Beckmann's improved "gefrierapparat." Both glacial acetic acid and benzene served as solvents, and two series of readings were taken in each case. The results were calculated by Ravoult's formula, $m = c\frac{p}{t}$, in which

m is the molecular weight of the substance,

p, the number of grammes in 100 grammes of the solvent,

t, the depression of the freezing point, caused by the addition of p, and

c, a constant dependent upon the nature of the solvent.

The values of c used are those given by Ostwald,[36] and are 38.8 for acetic acid and 53.0 for benzene.

The results will be given numerically in the following table and as plotted curves:

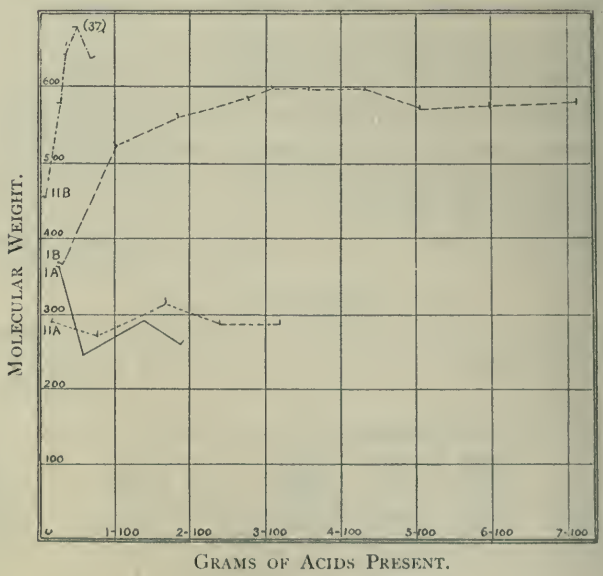
TABLE OF MOLECULAR WEIGHTS.

Curve.	Grms. Acid.	p.	t.	m.
I. A	Acetic Acid (17.181 g.)			
1)	0.0449	0.2613	0.028	361.08
2)	0.1022	0.5949	0.095	242.96
3)	0.2374	1.3818	0.185	290.64
4)	0.3811	1.9039	0.274	259.58

Curve.	Grms. Acid.	p.	t.	m.
II. A	Acetic Acid (17.863 g).			
1)	0.0333	0.1864	0.025	289.29
2)	0.1439	0.8057	0.117	267.18
3)	0.2995	1.6769	0.207	314.32
4)	0.4235	2.3713	0.334	288.45
5)	0.5569	3.1908	0.432	286.58

Curve.	Grms. Acid.	p.	t.	m.
I. B.	Benzene (15.415 g.).			
1).....	0.0403	0.2614	0.038	364.64
2).....	0.1589	1.0308	0.105	520.30
3).....	0.2805	1.8196	0.172	560.05
4).....	0.4279	2.7746	0.251	585.86
5).....	0.4741	3.0753	0.273	597.04
6).....	0.5448	3.5342	0.314	596.51
7).....	0.6621	4.2953	0.382	595.93
8).....	0.7765	5.0373	0.466	572.93
9).....	0.9206	5.9721	0.549	576.64
10).....	1.0981	7.1235	0.649	581.72
II. B.	Benzene (17.967 g.).			
1).....	0.0092	0.0512	0.006	452.35
2).....	0.0549	0.3056	0.028	578.44
3).....	0.0695	0.3959	0.033	635.58
4).....	0.0945	0.5260	0.041	679.88[37]
5).....	0.1205	0.6707	0.056	634.72

Molecular Weight Curves.



The curves of the two solvents are very different and at first sight irreconcilable. The acetic acid curves, though very irregular, indicate a molecular weight a little below 300. The benzene curve shows an increasing weight until 600 is reached, which is very soon, when it remains practically constant at points very close to 600. The downward tendency and to a certain extent the irregularity of the acetic acid curves can be explained by the extreme hygroscopic nature of the acetic acid, a mere trace of

moisture, such as might be absorbed during the experiment,[38] sufficing to increase the depression of the freezing point and consequently diminishing the indicated molecular weight, as in the formula $m = c\frac{p}{t}$ or $mt = cp$, it will be seen that t and m must vary inversely if cp has a definite value. The position and form of the benzene curve can be explained by the fact that benzene does not exert the dissociating influence that water and acetic acid do, except to a slight extent in very dilute solutions. Hence if the so-called physical molecule be composed of more than one chemical molecule, the tendency of the acetic acid would be to separate them into the chemical molecules, while the benzene would tend to preserve the larger molecule more or less.[39] Applying these observations to the molecular weight curves of the resin acid, it may very reasonably be concluded that the acetic acid curve indicates a chemical molecule with a weight of about 300 or below, and the benzene curve, a double molecule, very close to 600. The rise at the beginning indicates that in the dilute benzene solutions first used a partial dissociation into the smaller molecule of 300 took place, which might be expected. Upon examination of the formulas proposed we find that the formula already agreeing best with the analytical results, agrees best with the molecular weight derived above. Calculated according to the formula $C_{20}H_{30}O_2$ it is 302 (or by the latest atomic weights of Lothar Meyer, 301.32.)[40]

ROTATORY POWER.

The rotatory power of the acid was determined in alcoholic solution. It is laevogyrate.

	I.[41]	II.	III.	IV.
s	0.6759	0.8102	1.5579	2.9023
S	41.451	47.758	49.458	53.608
p	1.6303	1.6682	3.0969	5.1539
d	0.8174	0.8152	0.8190	0.8224
t	18.	22.	22.5	22.
l	1.	1.	1.	1.
a	0.4858°	0.4453°	0.8090°	1.3603°
$[a]_D$	36.261°	32.748°	31.893°	32.206°

s = amount of substance.
S = amount of solvent.
p = percentage strength of solution.
d = density of solution.
t = temperature.
l = length of tube in decimeters.
a = average angle of deviation for 1 dm. and 2 dm. tubes reduced to 1 dm.

$$[a]_D = \frac{100.\, a}{l.\, p.\, d.}$$

For convenience in comparison the rotatory power of acids already mentioned will be repeated in the following table:

COMPARATIVE TABLE OF ROTATORY POWERS.

Investigators.	Acid.	$[\alpha]_D$.
Haller	Sylvic.	-53°
Vesterberg	d Pimaric.	$+72.5^\circ$
	l Pimaric.	-272°
Valente	Abietic.	$+37.87^\circ$
Bischoff	Isosylvic.	$+63^\circ$
Peters	Canada Balsam.	-58.14°
Hackendahl	Black Pitch.	-36.09°
Kuntz	Burgundy Pitch.	-18.45°
	Rosin.	-32.28°

The rotatory power of the rosin acid agrees best with that of the acid obtained from black pitch last year. Of the acids previously examined, Haller's sylvic acid is nearest, $[\alpha]_D$ -53°.[42] Vesterberg's pimaric acids are too far removed to be considered. This opinion is confirmed by the crystal forms, which show scarcely an angle that can be compared with those measured on the rosin acid crystals. Great stress can not be laid on the differences in rotatory power, as the acid from black pitch was rendered inactive last year by simple distillation under diminished pressure.

DETERMINATION OF COEFFICIENT OF REFRACTION.

This physical constant was determined in alcoholic solution with a Pulfrich's Totalreflectometer by M. Wolz. The following table will give the data and the refractive coefficient as calculated. The formulas used in the calculation are as follows:

$n = 1'N^2 - \sin^2 i$, Pulfrich for instrument.

$r^x = \frac{n^2 - 1}{(n^2 + 2)d}$, Lorentz.

$\left(\frac{x}{y} + 1\right) r = \frac{x}{y} r_s + R$, Gladstone generalized.

In these

n = index of fluid examined.
N = index of glass prism, 1 61495.
i = angle read from instrument.
d = density of fluid.
t = temperature.
r_x = coefficient of fluid examined.
r = coefficient of the solution.
r_s = coefficient of the solvent.
R = coefficient of the substance.
M R = molecular coefficient of the substance.
1 = number of double bonds.
n = amount of solvent used.
y = amount of substance used.

	Alcohol.	I.	II.	III.
x.....	100	40.770	39.918	42.599
y.....	.....	0.7431	1.4746	2.6003
i.....	59°:45′	59°: 18′	58°: 50′	58°: 20′
n.....	1.36450	1.36701	1.36963	1.37247
d.....	0.8137	0.8177	0.8215	0.8256
t.....	20°C.	20°C.	20°C.	20°C.
r.....	0.274269	0.274675	0.275085	0.275614
R.....	.....	0.2980±	0.29718	0.29767
MR.....	.....	89.7973	89.58024	89.69789
F.....	.....	2.60	2.47	2.54

The factors used in determining the excess of molecular refraction over what it would be if the condition known as double bonding or linking of carbon atoms and carboxyl union of oxygen were not present are those of Conrady[43] and are as follows:

C (in C—C)=2.501, second bond in (C=C)=1.707
O (in O—H)=1.521, O (in C=O)=2.287. H=1.051.

The properties of the compound are such as to justify the assumption of the presence of a carboxyl group $-C\begin{matrix}O\\OH\end{matrix}$.

The value of this group can be readily calculated as follows:

O in OH	= 1.521.
H	= 1.051.
O in C=O	= 2.287.
C in C—C	= 2.501.
$-C\begin{matrix}O\\OH\end{matrix}$	= 7.360

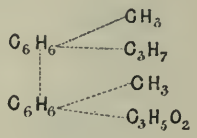
The coefficient of the acid is 89.6918. The difference 82.3318 is the coefficient of the remainder of the compound, viz. of the radicle $C_{19}H_{29}$. If there were no double bonds present, the calculated value of this group would be the sum of 19x2.501 and 29x1.051, or 77.998, which is smaller by 4.3338 than the actual value found by experiment. If this number is divided by 1.707, the value of a second bond over a single linkage between two carbon atoms, the quotient. 2.53, is obtained; thus indicating two double bonds.

CONCLUSION.

Chemists have early observed the resinification of volatile oils[44] and have assumed that these resinous products were formed by polymerization and oxidation. Thus rosin has been looked upon as a polymerization and oxidation product of pinene, the principal constituent of turpentine oil.[1],

By careful fusion with alkali, Maly, Emmerling[20] and Bruylants[45] have

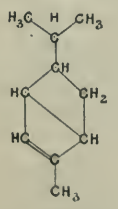
obtained propionates of the alkalies employed[51]. Pinene being considered to be methyl-propyl-dihydrobenzene, Burylants ventured to assign the following formula to pimaric acid:



It will be readily seen that the above mentioned observations are not sufficient evidence for the assumption of such a formula. However, the general view, namely, that the resins have been formed by polymerization and oxidation, has been strengthened within recent years. Thus Wallach[46] has obtained by the destructive distillation of caoutchouc, isoprene C_5H_8 and dipentene $C_{10}H_{16}$. He has also observed that isoprene will polymerize to dipentene, and dipentene to the polyterpene-like caoutchouc. The products of ordinary destructive distillation[47] of rosin have been found to be so numerous that no definite conclusions as to the constitution of rosin could be deduced from them. Within the past year, however, Wallach[48] has obtained large quantities of both pinene and dipentene by subjecting rosin to destructive distillation under greatly diminished pressure. The occurrence of these two terpenes in large percentages among the distillation products of rosin, points strongly to the existence of the pinyl radicle within the rosin molecule. The fact that dipentene occurs side by side with pinene does not point towards its preëxistence in the rosin, since the readiness with which pinene is inverted into dipentene when subjected to heat has been thoroughly studied.

The assumption, therefore, that rosin or the rosin acids have been formed by polymerization of two molecules of pinene, while simultaneously one of the side-chains of one terpene molecule has been oxidized, can no longer be considered as a mere matter of fancy.

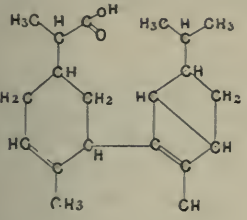
Assuming that Wallach's formula for pinene,



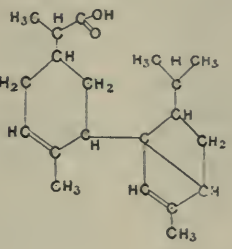
is correct, it will be seen that ten formulas for resin acids, in which the methyl radicle of a propyl group has been oxidized to .C$\begin{matrix} O \\ \diagdown \\ OH, \end{matrix}$ are possible, and still have a pinyl radicle. The following formulas furthermore

assume that the union is effected by a broken parabond (see Coefficient of Refraction) and that the benzene nuclei are directly joined.

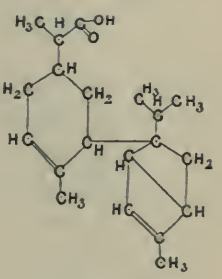
I



II



III



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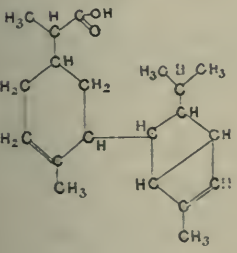
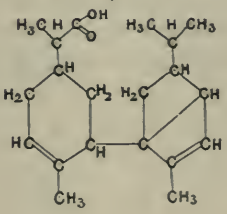
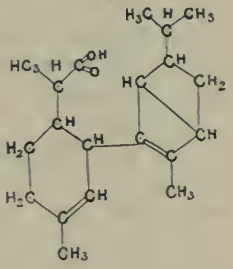


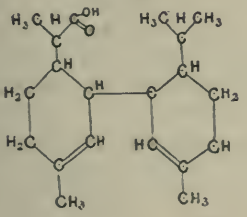
V



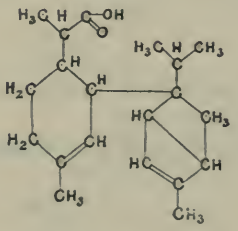
VI



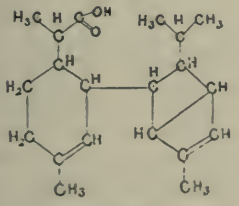
VII



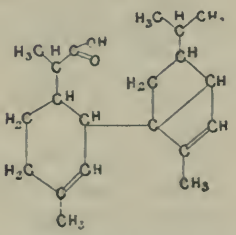
VIII



IX

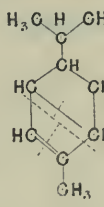


X

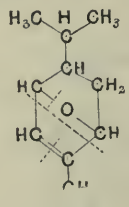


Of these formulas, I is to be preferred. Not only does this show a pinyl radicle within the rosin molecule; but it also explains in a very simple manner the simultaneous formation of certain oxidation products which Schreder,[19] Emmerling[20] and others have obtained, viz. trimellitic, isophthalic, oxalic and terebic acids. Especially does the formation of terebic

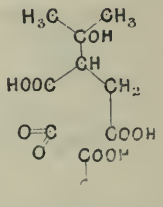
acid from pinene under the same circumstances, as shown by Wallach in his experiments on pinol,[50] indicate this. His explanation is indicated in the following diagrams:



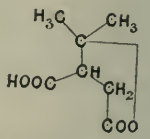
Pinene.



Pinol.

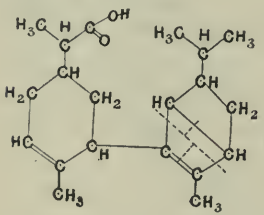


Diaterebic acid, Oxalic acid and Carbon dioxide.

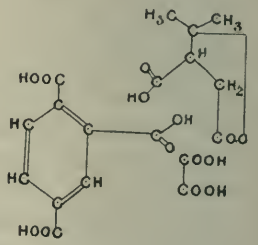


Terebic acid.

By uniting the carbon atom that is split off as carbon dioxide with a pinene molecule by a broken parabond in that molecule, as is the case with the oxidized radicle in Formula I, we have the analogous reaction taking place as follows:

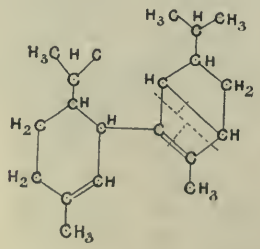


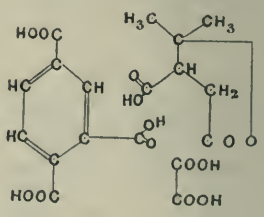
and by continued oxidation,



i. e., the trimellitic, terebic and oxalic acids actually obtained by oxidation with nitric acid.

Formula VI. will give identical oxidation products, as indicated thus:





These formulas are not intended as ultimate conclusions. The evidence at present is so meagre that no formula can be said to be proved. They are merely intended to indicate lines along which further investigation must be carried on. During the past year, while studying the physical properties, a large amount of material has accumulated with which it is intended to carry on in the near future experiments relative to the chemical structure.

As regards name, the one most generally in use, given by Maly to the acid of American rosin, viz., abietic acid, had better be retained, temporarily at least, especially as it is probable that the acid is found in certain Abietes, and particularly in the Pini, a closely related genus.

NOTES AND REFERENCES.

[1] It will be well to notice at this point that these volatile oils differ quite markedly, French turpentine oil contains a large portion of lævogyrate pinene, while the American turpentine oil is almost entirely dextrogyrate pinene.

[2] The name under which this substance is frequently official in pharmacopœias, colophonium, comes from the name of the town Κολοφών, in Asia Minor, from which it largely came in ancient times.

[3] Proceedings Wis. Pharm. Association, 1892. pp. 45–55.

[4] Ann. Chem. Pharm., Vol. 13, pp. 169 and 184; from Pogg. Ann., Vol. 11, p. 393.

[5] Ann. Chem. Pharm., Vol. 13, pp. 169 and 184; also Gmel. Hand-book, Vol. 17, p. 378.

[6] Ann. Chem. Pharm., Vol. 13, p. 184.

[7] Ann. Chem. Pharm., Vol. 13, p. 169.

[8] In this article we have mention of the shape of crystals. They are spoken of as rhombic tabular; but it is uncertain whether Unverdorben's or Tromsdorff's are meant, though I incline to the opinion they refer to Unverdorben's alone.

[9] Ann. Chem. Pharm., Vol. 40 p. 311. [52].

[10] Ann. Chem. Pharm., Vol. 13, p. 174.

[11] Ann. Chem. Pharm., Vol. 34, p. 272.

[12] Ann. Chem. Pharm., Vol. 68, p. 335.

[13] Gmel Hand-book, Vol. 17. pp. 318–325; from Zeitsch. fur de ges. Naturwisssenchaft. Vol. 14, p. 311; and Kopp's Jahrber. 1859, p. 508.[53]

[14] Ann. Chem. Pharm., Vol. 129, p. 94, and Vol. 161, p. 115.

[15] Ann. Chem. Pharm., Vol. 132, p. 249.

[16] Ann. Chem. Pharm., Vol., 148, p. 143.

[17] Chiefly P. maritima, and perhaps, P. sylvestris.

[18] A. Stecker, Ann. Chem. Pharm., Vol. 140, p. 131, in the controversy that arose with Maly, defends very vigorously the results of Duvernoy's investigations, the work having been done under his supervision.

[19] Bull. Soc. Chim., Vol. 21, p. 387; abst. Jour. Chem. Soc., 1875, p. 475. and Ber., Vol. 7, p. 485.

[20] Berichte, Vol. 12, p. 1441: abst. Jour. Chem. Soc., Vol. 38, p. 264.

[21] Berichte, Vol. 13, p. 888; abst. Jour. Chem. Soc., Vol. 38, p. 670.

[22] Berichte, Vol. 17, p. 1885; abst. Jour. Chem. Soc., Vol. 46, p. 1364.

[23] Berichte, Vol. 18, p. 2165; abst. Jour. Chem. Soc., Vol. 46. p. 1241.

[24] Berichte, Vol. 18, R. p. 190: from Atti. d. Acc. d. Linc. Ret., Vol. 1, p. 13.

[25] The original reference reads $[a]_D = \pm 37.87^\circ$.

[26] Berichte, Vol. 18, p. 3331; abst. Jour. Chem. Soc., Vol. 50, p. 365.

[27] Berichte, Vol. 19, p. 2167; abst. Jour. Chem. Soc., Vol. 50, p. 1038.

[28] Berichte, Vol. 20, p. 3284.

[29] Berichte, Vol. 23, p. 1921.

[30] Four methods were tried, treatment with diluted and strong alcohol, with and without sulphuric acid. (See Husemann-Hilger's Die Pflanzenstoffe, Vol. 1, p. 392.) But little or nothing was gained by the use of sulphuric acid either as regards speed or facility of crystalization, as some claim, while the mother liquor was rendered uncrystallizable. The precipitation of an alcoholic solution by lead acetate, followed by decompesition

with hydrogen sulphide, afforded good results, as did precipitation of the soda soap by hydrochloric acid.

[31] The supposed lead sulphide was again treated with alcohol and hydrogen sulphide, yielding a solution of the acid. This has been repeated six or eight times without completely decomposing the lead salt of our resin acid. This is considered rather strange, as in former years no difficulty had been noticed in decomposing these lead precipitates.

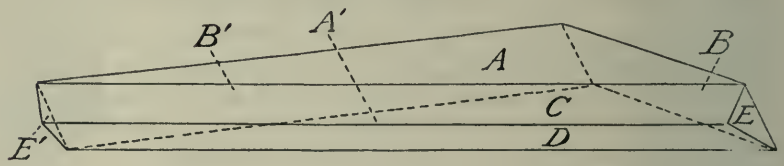
[32] At the time of writing, five months after solution, the mother liquor is thick and white with fine soft crystals.

[33] These melting point tubes were from 1.0 to 1.5 mm. in diameter. The temperature was allowed to rise extremely slowly.

[34] Much more difficulty was encountered in this method of obtaining the crystals, as the tendency seemed to be to form a dark reddish brown mass, amorphous or very difficult of crystallization.

[35] Angles on six crystals have been measured with the following average results:

FIG. 32.



Crystals.

AB = 110 : 41 1/3	BE = 97 : 38 1/4
A′B = 69 : 31 2/3	DE = 104 : 55
CD = 94 : 46 1/2	CE = 135 : 30 3/4
AC = 132 : 10 5/6	Faces C and E undeveloped { AD = 47 : 39
A′D = 132 : 14 1/3	{ BD = 45 : 30 3/4

However, from a crystal where A, A′, B and B′ allowed of fair measurements, the following angles were taken:

A′B = 68 : 24	AB′ = 70; 41 calculated
AB = 111 : 20	A′B′ = 109 : 19

The difference between the angles A B and A′ B′, 2° 1′, being outside the limit of error in this case, cannot be reconciled with the optical properties of the crystals. With polarized light the face A shows extinction when the edge A C is either parallel or perpendicular to the plane of polarization. The interference figure has a like position. These features correspond best to a hemihedral orthorhombic form. This, however, would require that the angles A B and A′ B′ be equal. It was, therefore, thought advisable to forego a positive statement until more conclusive measurements of the angles in question could be made.

[36] Ostwald's Solutions, p. 229; and Ostwald's Lehrbuch, Vol. 1, p. 766.

[37] The position of these points cannot be explained satisfactorily.

[38] This irregularity was largely prevented by the use of Beckmann's Improved "Gefrierapparat."

[39] Cf. Ostwald's Solutions, chapter on Freezing-points, near the end, particularly the behavior of acetic acid in aqueous and in benzene solutions, p. 242.

[40] The other formulas require molecular weights of 712 (Maly) and 304 (Rose).

[41] Experiment I was made at low temperature, with an alcohol of noticeably higher specific gravity. Experiments II, III, IV were made at the same time with an alcohol of lower specific gravity and with an acid in the form of pure white selected crystals, after a second crystallization from ether and finally from alcohol.

[42] Valente's acid[23] agrees best as regards figures, viz., 37.87°, but nothing can be drawn from it on account of the uncertainty regarding the sign, which was published first as ± 37.87c and afterwards as +37.87°. Cf., however, Bischoff's isosylvic acid $[\alpha]_D$ —63.[29]

[43] Ostwald's Lehrbuch d. allg. Chemie, p. 444.

[44] Ann. Chem. Pharm., Vol. 6. p. 270.

[45] Berichte, Vol. 11, p. 448.

[46] Ann. Chem. Pharm., Vol. 227, p. 292.

[47] A. Renard, in Bull. Soc. Chim., Vol. 36, p. 215: Comp. Rend., Vol. 92, p. 887, Vol. 94, p. 727, Vol. 95, pp. 141, 245 and 1386, and Vol. 97, p. 111; and Ann. Chim. Phys., Vol. 1, p. 223: Abst. in Jour. Chem. Soc., Vol. 40, p. 738, Vol. 42, pp. 64, 737, 1179 and 1301, Vol. 44, p. 599, and Vol. 46, pp. 83 and 843.

[48] Ann. Chem. Pharm., Vol. 271, p. 308; abst. Jour. chem. Soc., 1893, abs. p. 101.

[49] Berichte, Vol. 6, p. 413.

[50] Ann. Chem. Pharm., Vol. 253, p. 259.

[51] Either immediately, or by a very simple change afterward.

[52] In Jahrsb. der Fort. der Pharm. u. s. w., Vol. 23, p. 10. it is reported that W. Schkatelow obtained this acid in crystallized form, melting at 143°. It had the composition $C_{40}H_{58}O_5$, but yielded a silver salt of the composition $C_{29}H_{29}AgO_3$. (From Jour. d. Russ. phys. ch. Ges. 1888, p. 477, et al.).

[53] Flückiger soon after worked on resins. An unsatisfactory review of his work is given in Jahrsb. d. Fort. d Pharm. u. s. w., Vol. 2, p. 35. The abietic acid there mentioned melted at about 150° C. and crystallized in triangular tablets.

An abstract of the following paper was read by Prof. A. B. Stevens.

SCALE PHOSPHATE OF IRON AND ITS INCOMPATIBILITY WITH QUININE.

BY J. D. FROMM.

The scale Phosphate of Iron, when introduced into the 1880 U. S. P., supplied a preparation of iron and phosphate which was both soluble and of good appearance.

Prepared by mixing two salts in proportion for double decomposition, yet it is of very doubtful composition. Sodio-ferric phosphate, sodio-ferric citrate, and ferric citrate are probably the compounds which the scales consist of.

Its solubility and beautiful color, together with its very slight ferruginous taste, make it a very desirable preparation. It is chiefly used in combination with quinine and strychnine in the elixir of the National Formulary, which is the most agreeable way of administering in solution two of the most disagreeable medicines. However, the beauty of this preparation is somewhat spoiled in the course of a few months by the formation of a dirty white precipitate, and the darkening of the solution.

Innumerable changes in formulas have been proposed for the prevention of this change, consisting in the change of amount of alcohol, the substitution of quinine muriate for quinine sulphate ,and the addition of glycerine.

But no matter by what formula prepared, the elixir is bound to precipitate in the course of time. Exposure to light hastens this change. From

a 4 ℥ bottle of elixir made in April by a formula which contained an addition of potassium citrate, the precipitate was filtered out by use of filter pump and washed with cold water.

The precipitate was dried at 110° and weighed, it weighing .6725, and representing about one-third of the quinine in the elixir.

It was very soluble in glycerine and alcohol, and only slightly soluble in water.

A portion dissolved in HCl and boiled with $BaCl_2$ showed no precipitate, on standing showing absence of H_2SO_4. A second portion was dissolved in dil. HNO_3, and made alkaline with KOH and shaken out with ether and $CHCl_3$ until the aqueous solution on acidulating gave no precipitate with Mayer's reagent.

The alkaline solution of the acids was filtered and left a slight residue of $Fe(OH_3)$.

The filtrate was acidified with HNO_3 and made alkaline with ammonia, and magnesia mixture was added, and it was allowed to stand 24 hours. At the expiration of that time a light precipitate had settled. This was filtered and washed with ammonia. Dissolved in acetic acid and ammonium molybdate, after 24 hours a small amount of the yellow phosphomolybdate had settled.

This showed the presence of a small amount of a phosphate either as insoluble $FePO_4$, or as the soluble phosphate which was held by the precipitate.

The filtrate from the magnesium ammonium phosphate was taken and exactly neutralized with HNO_3, and lead acetate was added, when an abundant white precipitate of citrate of lead which dissolved on heating, and was reprecipitated on cooling.

The ether solution of quinine, etc., was acidulated with H_2SO_4, and potassium ferrocyanide was added, which produced a slight precipitate, which did not correspond to strychnine. Needless to say, the solution responded to all the tests for quinine.

The precipitate now to all appearances consisted of a citrate of quinine carrying with it a small quantity of $FePO_4$.

Three citrates of quinine have been prepared by Mandalin, having the following formulas and solubilities:

Acid Citrate.

$C_{20}H_{24}N_2O_2C_6H_8O_7$, consisting of 64.55 per cent. of quinine and 32.43 per cent. of citric acid, of which 100 parts of water dissolve .1566 parts at ordinary temperature.

Normal Citrate.

$(C_{20}H_{24}N_2O_2)_3(C_6H_8O_7)_2$, consisting of 72.99 per cent. of quinine and 28.61 per cent. of citric acid, of which 100 parts of cold water dissolve .1133 parts.

Wittstein's Basic Citrate.

$(C_{20}H_{24}N_2O_2)_2C_6H_8O_7$, consisting of 78.28 per cent. of quinine and 20.32 per cent. of citric acid, of which 100 parts of cold water dissolve .1093 parts.

To determine which citrate the precipitate consisted of, .267 were dissolved in alcohol by the aid of heat and titrated with $\frac{n}{10}$ KOH in the presence of phenol phthalein: the latter being indifferent to the alkaloidal quinine, 13.7 c.c. of $\frac{n}{10}$ KOH were required. These represent the citric acid in combination.

$13.7 \times .0064 = .08768$ amount of citric acid in sample taken. $\frac{.08768}{.267} = 32.1$, the per cent. of citric acid in the precipitate.

The alcohol was drawn off from the quinine by heat and the residue was dissolved in dilute HCl.

The acid solution was made alkaline with KOH, and shaken out with ether until the aqueous solution, on acidulation with H_2SO_4, gave no precipitate with Mayer's reagent.

The ether solution was filtered through a filter wet with ether, and the ether was allowed to evaporate.

The quinine was then dried at 110° and weighed .175. $\frac{.175}{.267} = 65.5$ per cent. of quinine in the precipitate. The loss of 2.4 per cent. of the entire precipitate is due to the impurity of $FePO_4$; also, to moisture. As will be seen, the proportions of quinine and citric acid correspond closely to the acid citrate of Mandalin, $C_{20}H_{24}N_2O_2C_6H_8O_7$.

In writing his formulæ, Mandalin considers quinine as a diacid base, and considers ⅔ of the citric acid in the acid citrate as having been neutralized by the quinine. But as we at present consider quinine as a non-acid base, probably only ⅓ of the acid has been neutralized by the quinine. Its solubility in cold water is 1.566 in 1000, making it the most soluble of the three citrates. From this short investigation it would seem that the incompatibility of quinine with phosphate of iron of the 1880 U. S. P. depended on the citrates present.

The precipitate being soluble in alcohol and glycerin, the incompatibility might be overcome by increasing the alcoholic strength of the elixir, or by substituting glycerin for the syrup in the elixir.

But a large amount of alcohol or glycerin would be objectionable.

If we should attempt to devise a method for the preparation of a soluble phosphate of iron without the use of citrates, we could use two other substances, either ammonium tartrate or ammonium hydrate.

$FePO_4$ dissolves in NH_3, but on attempting to evaporate, as soon as the NH_3 is driven off the $FePO_4$ is precipitated.

A salt could be made by dissolving $FePO_4$ in $(NH_4)_2C_4H_4O_6$; but here we have the same difficulty that we had with the U. S. P. salt, the quinine tartrate being even more insoluble than the citrate.

In conclusion, it would seem that the only way out of the difficulty would be for the pharmacist to make the physician acquainted with the elixir of iron, quinine and strychnine of the N. F., in which $FeCl_3$ is used in the place of $FePO_4$.

REFERENCES.

K. F. Mandalin, Arch. Pharm., 1879, 129 Cit. Quin.
Watt's Dictionary, Vol. 4, p. 563.

THIRD SESSION.

The Section was called to order at 11:15 P. M. by Chairman Fennel. The minutes of the second session were read, and on motion were approved.

MR. FENNEL; In retiring from the position of Chairman of this Section, I desire to thank my associates and the members of the Association for the hearty support given me during my term of office. The meetings of this Section, in spite of the many attractions which might have detracted from them, have been well attended, and this is certainly to be greatly appreciated.

I now have the pleasure of resigning my position to my able successor, and will request Mr. Ebert to introduce to you the new chairman of this Section, Professor Sayre of Kansas. He is so well known to the members of the Association and to the pharmacists of the United States that he requires no further introduction.

MR. SAYRE: I thank you, gentlemen, for the honor you have conferred on me, and can assure you that my efforts in the cause of this Section during the coming year will amply prove to you that the honor is not unappreciated. If the extent of my appreciation were to be measured by words, I should have to make a very long speech; but as it is now nearly midnight, you will probably be willing to excuse me from this duty, and merely permit me to wish you pleasant dreams. Again I thank you.

Mr. FORD, the Secretary-elect, also briefly responded, acknowledging the honor of his election.

The Section then adjourned.

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

FIRST SESSION—THURSDAY MORNING, AUGUST 17.

The first session of the Section was held in Hall 24 of the Art Palace, and was called to order by the chairman, Dr. R. G. Eccles, at 10.30 o'clock. In the absence of the Secretary, Mr. L. C. Hogan, Mr. H. M. Whelpley acted as Secretary *pro tem.*

The Chairman read the following address:

Fellow-members American Pharmaceutical Association:

The tale of Pharmaceutical Education and Pharmaceutical Legislation is the story of the evolution of the pharmacist. Up to the present time the wasteful and unsatisfactory process of natural selection has held full sway. We now want scientific, artificial selection, and want it badly. Slowly but surely are American pharmacists coming to the conclusion that laws should be discovered and not made. True laws, that are likely to be perpetuated, are lines of social harmony—modes of adjustment between man and his fellow man—whereby the eternal verity we call justice is most fully subserved. To every society there is a condition of greatest possible equilibrium, due to the combined natures and requirements of its units. Any deviation from this state results in strain, and must sooner or later be righted, or end in disruption. To try to enact and enforce arbitrary laws that do not follow the heaven-ordained lines of social harmony, is to try to injure our fellow beings, and, by reaction, ourselves. However slight the deviation may be, its work from its very inception leads to evil results. One evil engenders another and another, until a maze of hateful complexities arises, and slothful sufferers are aroused to antagonistic action. Society always seeks to adjust itself to every new enactment. As no sudden change can occur without pinching somewhere, and as one shifts the pinch to another, if the law is a true one, by this process of diffusion all are finally relieved. On the contrary, if it is arbitrary and false, there can be no diffusion, but intensification of the pinch the longer it lasts. Readjustment is certain to be demanded some time. This means injury to thousands. Every legislative blunder inflicts twice; it damages while being tried, and it is responsible for the effort due to repeal. Every new law, whether good or bad, is sure to make suffering somewhere. The only just sanction for new legislation of any kind should come from the proof that the new enactment will lead to higher social harmony, where all the harm done by it will be paid back with heavy interest in greater human comfort. No one should, therefore, propose to legislate on any subject until he has drawn a balance sheet with its debits and credits, showing all conceivable gains on one side and losses on the other. Whoever tries to hide the disadvantages and to exaggerate the advantages of any proposed legal enactment, is an enemy of

his kind. The study of laws already on our statute books, for the purpose of ascertaining their worth, and necessarily their permanence, should be conducted along the same lines. Test them all by justice. Law that is not justice is mortal. Law that is justice is immortal. If we are truly conscientious and want the exact truth, we will anxiously seek for everything that the enemies of any measure can say against it. We cannot post the debit side of our ledger without such help, and unless we get both sides accurate, we are increasing the sum of human misery, where, if true to ourselves, we could help to diminish the same. What would any of us think of a book-keeper who would refuse to charge up expenditures for the purpose of deceiving himself into the pleasing belief that he was keeping up his bank account? All State Associations should seriously and candidly debate every proposed enactment that affects their interests, and ask for no changes or amendments that they are not confident will be for the general good, rather than their own personal gain. This Association should do the same. We must always insist on getting the very facts that we wish did not exist, and that are repugnant to us. In interpreting existing laws, we should always do so in a liberal manner. The most dangerous enemies of pharmaceutical progress in this field are those who undertake to interpret in a selfish way. Dry goods men and grocers have as much right to sell goods that do not require technical skill or knowledge to handle with safety to the public, as any pharmacist has. Whoever makes the attempt to stop them, is going to injure the cause of true pharmacy.

A great deal is being said at present about reciprocal registration between different States, and between sections of the same State, acting under different laws. Here the same rule obtains as that already pointed out. If the public weal is better served with than without reciprocal registration, then the refusal to adopt it will endanger all progressive legislation. The form such reciprocation should take, if found to be right, must seek to deal justly by the public and the migrating pharmacist. To refuse to deal leniently by a fellow pharmacist because we fear he will increase the competition within our State, is to render such legislation obnoxious to all fair-minded pharmacists. It would be a very good thing for this Section to undertake, during the coming year, to ascertain from every Board of Pharmacy what evils they think would result from reciprocal legislation, what gains would be like to accrue and on what terms they are willing to reciprocate with other States. It would be well also to hear what some of the migrating druggists have to say about it, if some of the Boards will supply their addresses.

Examinations, not only with Boards of Pharmacy but likewise with colleges, should as quickly as possible cease trying to find out which men are nearest like Edison's phonograph. It can with perfect fidelity repeat every lecture talked into it and every chapter read into it; yet, after months or years in a college of pharmacy, it would know absolutely nothing about the subject. How long must we wait before deeds and not words shall be the tests of our knowledge. What can you do, not what can you, like a parrot, repeat? Hand out to the candidate some powdered and some crystalline salts, and have him tell what they are. Be sure that they are common articles in the store, that might get confounded. Give him some prescriptions and have him tell the dangerous from the harmless, the correct from the incorrect, and how he would proceed to compound them. Have him determine the amounts of impurity in common drugs. Let there be no catch questions or puzzling specimens presented. Keep to the simple every-day facts and requirements of the store. Let the tests all be such that inability on his part to meet them would be a menace to public health. When Boards of Pharmacy adopt these simple rules of justice, colleges of pharmacy will begin to weed out much of the information they are now imparting that is without doubt of value, but not so valuable as these neglected essentials. No doubt it would be a very cute thing to teach little children that when they walk the flexor brevis, minimi digiti and the abductor pollicis come into play, and when they talk the thyro-arytenoid and the crico-arytenoid muscles are of great importance.

Let us not forget, however, that they can get along very well without such information. They use them practically without knowing much about them. Even so a large amount of the information expected from pharmaceutical students could be done without. Necessarily this consumption of valuable time keeps them from acquiring practical knowledge concerning which there should be no excuse for ignorance. Nature has a habit of compelling us to act first and acquire the meaning of such acts afterward. As a rule we have no desire to know why a certain act is possible until we have first tried it. Let students of pharmacy learn tests for drugs they are handling and they will desire a knowledge of chemistry. Have them volumetrically assay samples, and they will inquire into the principle by which it is done. Teach them to discriminate between genuine and spurious herbs of the kinds supplied by druggists, and they will long to know something of botany. Show them genuine and spurious powdered drugs under the the microscope, and they will soon want to know something about that instrument. Practice them upon marked cases of incompatibility that can be corrected, and they will endeaver to ascertain why the difference exists. In fact action brings hunger, and hunger provides good digestion and good assimilation. To cram mental pabulum on minds unprepared for it by awakened desire is to court mental dyspepsia, and encourage mediocrity or imbecility. The birth of every science is preceded by experimenal data, and not the reverse. The schoolmen had theory first and practice after, and as a result came the dark ages. Without experience there is no desire for sound knowledge. When theory precedes experience we get dreamers as a product. Experience without theory is far better than theory without experience. The former will make a patient, industrious student; the latter, a flighty builder of air-castles. Given time to the first, and the deficiency will correct itself; but with the last there is usually so burning a desire to accomplish wonders and startle the race, there is no time for the necessary drudgery that could make the correction. Every triumph over nature and the discovery of every natural law is a sequence of knowing how to do first and why we do last. The sneer which, perhaps, lurks on the features of some skeptic present is a standing proof of the truth of this claim. That sneerer used his *levator labii superioris alæque nasi* without knowing the fact, and possibly unconscious of the existence of such a muscle.

Concerning ancient Hebrew laws it was said eighteen centuries ago that "the letter killeth, but the spirit giveth life." This is equally true in some respects of modern law. For the purpose of encouraging home industry and discouraging importations, protection and patent laws have been formed. Strange to say, however, so far as the new German synthetic remedies are concerned, these same laws serve to discourage, yes, even prohibit home manufacture. We are giving protection to German workmen in Germany, and refusing it to American workmen in America. We practically fine the sick for being sick, to the extent of one dollar and ten cents per ounce on all the sulphonal they use, eighty cents per ounce on all the antipyrine they use, and sixty-six cents per ounce on all the phenacctine they use. Nor have we even the consolation that this goes to swell the revenues of the nation and lighten the burthen of taxation on Americans. Instead of this, it goes into the pockets of foreigners who have absolutely no interest in America or Americans beyond the money they are able to filch from us, because of the anomalous construction of our laws. Some action should be taken by this Section looking toward a more sensible construction or interpretation of these laws. As they now stand they are absolutely indefensible on any theory of taxation or justice. They are equally obnoxious to the ideas of protectionists, free-traders and tariff-for-revenue advocates. They should at once be changed.

In conclusion, permit me to thank the many friends who so promptly responded to my call for papers for this Section. With far less effort than I at first intended to put upon the work, we have been able to beat the record of this Section. It is to be hoped that the future will give still better results. It should be our duty to keep a faithful

record of every gain in education and legislation, and likewise every important failure, for future guidance. We are sailing in new and unknown seas. Our charts have to be made, and we should begin the work of making them promptly. We should put on record year by year the number of students, graduates and licentiates in pharmacy, in a way to show the percentage of each as compared with the total population by states and in the nation. Improved facilities for education in books, apparatus and laboratories should be pointed out. The standard of education and exact teaching time of every college should be chronicled. Our present Secretary began some of this work a couple of years ago, and we should encourage its prosecution. As did my predecessors in the past, so do I now ask that he be continued as Secretary of the Section, that he may continue the task so well begun.

MR. SAYRE; The Chairman's address is so very important that I feel unprepared to make any other motion than to refer it to a committee of three, to report as to the disposition of it. My own opinion is, that sufficient copies of it should be printed and sent to every druggist in the land, but at this time I merely move that the address be referred to a committee, to report at the close of this session.

The motion was seconded and carried.

The chair thereupon appointed as said committee, Messrs. Sayre, Mittelbach and Caspari.

Before the Section adjourned, this committee presented the following report: "It is our opinion that the views expressed in the Chairman's address should receive the widest dissemination, and that his views regarding the hurtful effects of ill-considered legislation should receive the widest publicity."

On motion, the report was received and adopted.

The next business before the Section was the nomination of officers for the ensuing year; and nominations being invited, Mr. Sayre nominated the present Chairman, Dr. Eccles, and Mr. Simon nominated the present Secretary, L. C. Hogan.

On motion, the nominations were closed.

The Chairman read the following extract from a letter received from Dr. John Attfield, of London: "I am less sorry at the absence of myself and my words at your gathering, inasmuch as English pharmacy will be represented by the President of the Pharmaceutical Society of Great Britain, who is physically, mentally, educationally, ethically and socially as strong as a good round half dozen of us put together. I leave you in his hands, with the fullest confidence that you will not be disappointed. Again accept my regrets at my absence. My son, Dr. Harvey Attfield, was proud to visit the Attfield Hall at the older college of pharmacy in 1891; his father would have been prouder to find himself there in 1893. I would like to shake hands with my friends whom I have seen, Ebert, Oldberg, Remington, Saunders and others, and the many more with whom I have not had the pleasure of conversing."

The reading of papers being in order, the Chairman read the following, the author not being present:

THE HISTORY OF AMERICAN PHARMACY.

BY SAMUEL M. COLCORD, DOVER, MASS.

American pharmacy in this country when colonies of England, was in the hands of English people or their descendants: most of our drugs were imported from England, and much of the trade was in the hands of physicians or English apothecaries, who were acquainted with the English market. The leading men in the trade were well educated, dignified men of means, and the business was conducted honestly upon business principles.

The literature of the business was foreign, crude and meagre. As the country developed, the business became gradually Americanized, the same as other branches of business, according to the necessities of the times and the wants of the people.

There appear to have been no fixed standards for making pharmaceutical preparations, and the business became very much mixed. The country traders, the apothecaries and the physicians, all claimed a share of control in it, outside a few large cities. There were no national standards, universally or generally in use.

The books of formulæ, directions for making and compounding preparations, were all from single authors, without authority, and were used according to the judgment and taste of the dispensers, or the popularity of the authors. As a consequence, the apothecaries took the liberty of making formulæ that should average the strength of several authors and contain the best methods of compounding, each one having a book of his own private formulæ. The prominent examples of such private formulæ are elixir salutis, elixir proprietatis, spirit of lavender compound, and tincture of cinchona. This became a general practice, and had the advantage of creating a competition among the apothecaries as to whose preparations were the best. Many of the preparations were greatly improved, and many of them became celebrated, to the advantage of the proprietors. The formulæ and methods were kept strictly secret; in fact were proprietary under common names. In Boston elixir proprietatis varied in price from five (5) to twenty-five (25) cents per ounce.

The disadvantage was that the physician did not know what he was prescribing, and found that one apothecary dispensed just what he wanted, and another just what he did not want, under the same name. Of course this created a great deal of friction between the apothecary and the physician. The breach continued to widen, until the physician openly proclaimed that he looked upon the apothecary just as he did upon the mechanics who sharpened his instruments. The apothecary claimed that much the larger part of his trade came from the quacks and nostrum makers, and that he was obliged to take care of that trade to pay his expenses. The best of the physicians treated the apothecaries fairly, and were honestly and faithfully served in return.

Although physicians' prescriptions are not remunerative, the knowledge required to make a good dispenser gives the pharmacist a standing in the community that no other part of his business does. If the professors of medicine and pharmacy could work together, it would be a great public benefit.

The weights in common use were the Troy grain, scruple and dram, and the Avoirdupois ounce and pound.

The measures of capacity were ususally the divisions of the wine gallon, but the beer measure was then in common use.

A set of Troy pound weights was very seldom seen in an apothecary store, and when medicine was compounded the Troy grain and Avoirdupois ounce and pound were used. The capacity measure was still worse. In compounding prescriptions the apothecary did not know whether the prescriber intended by weight or by fluid measure, a thing which greatly perplexed the conscientious dispenser, as where ether, chloroform, honey, the balsams and the acids were prescribed, and if the prescriber was asked he could not tell which he wanted.

There were no laws to regulate the practice of pharmacy or the sale of drugs, medicines or poisons—no laws to regulate the writing of prescriptions. If a mistake or accident occurred, the physician usually tried to get the prescription, to destroy it or convict the apothecary.

The apothecary was loaded with responsibility, and received very little sympathy from physicians or the public. The majority of them were mere traders in drugs. Their education was very superficial, and there was no way provided for them to get a pharmaceutical education. A few of them attended the medical schools to hear the lectures on chemistry and materia medica, but with very little advantage; and many physicians who abandoned the practice of medicine, and became proprietors of drug stores, were found to be very deficient in their pharmaceutical education and became a second-rate class of dispensers.

There was no inspection of drugs, but a great amount of adulteration, sophistication and poor quality. America became the dumping ground for all the refuse stock in the world, and it was with difficulty that a good stock of drugs could be collected in any one city in the Union.

With local variations, this was the state of American pharmacy up to the year 1820, at which time there began a movement to create associations among the more intelligent apothecaries in several of the Eastern cities. For several years the efforts in most cases were comparative failures. The apothecaries would not combine and attend the meetings, presumably on account of the competition and jealousies among them.

In 1821 the Philadelphia College of Pharmacy organized as an educational institution, and persisted in its efforts to keep the school going. For years it struggled for existence, with full faith that if the time had not come for such a school, they would make a demand for it. In Philadel-

phia they had the material for both teachers and students, and ran it for the public benefit at a pecuniary loss. The institution gained strength annually; its instructors were indefatigable workers, and the pupils were true to the college and its professors. It became a success, and the college started the American Journal of Pharmacy, which became the leading journal in pharmacy.

In 1829 the New York College of Pharmacy organized a school of continuous instruction, which had a slow growth for some years, but is now in a flourishing condition, doing good work.

About this time Baltimore and Boston organized to create schools of pharmacy. There was considerable opposition to them, and want of united interest in them. It was difficult to get competent instructors, and more difficult to get classes, as there was no demand for educated assistants, because there were no educated proprietors. In Boston the proprietors became the first students, and applied to the Legislature of Massachusetrs for a College of Pharmacy, which was opposed by some of the wholesale druggists, and defeated chiefly by the influence of John and David Henshaw, David about that time being one of the secretaries of the United States Cabinet. These two organizations kept together, but were prevented from doing much work of public importance for some years.

In 1856 the Maryland College of Pharmacy was organized as an educational institution, and in 1867 the Massachusetts College of Pharmacy became organized for educational work, and now has a building erected for its own particular work, with a large library of carefully selected books, herbariums, and well-equipped laboratories for analytical pharmaceutical and microscopic work, said to be as good as any in existence. The specimen sample department is simply perfect in its arrangement for variety and quality. Each student takes with him to his desk the articles to be lectured on, and these are all returned to the cabinet at the end of the hour, and kept classified and numbered for constant use. The analytical work, is so perfect that they have detected one-three-thousandth ($\frac{1}{3000}$) part of a grain of arsenic in a sample of urine, and have proved it by the microscope.

The four colleges just mentioned were the pioneers in educational work and associated efforts. There was considerable correspondence between them, each one contributing what it could for the benefit of the other. Chicago, which was not socially connected with the Eastern colleges until 1852, had organized for educational work as early as 1859. St. Louis was organized as a school in 1866, Louisville in 1870. Cincinnati, which had become socially connected in 1852, was organized in 1871.

In 1850 a convention was called by the New York College for the purpose of getting a close and uniform enforcement of the United States Drug Inspection Law on all imported drugs and medicines. This convention appointed committees of investigation to report at an adjourned meeting

to be held in New York in 1851, and also to bring in plans for forming a National Association to meet annually, to promote a general advance in pharmaceutical education, to create a demand for a higher grade quality of drugs, to suppress adulteration and empiricisim, and, in general, to elevate the character and standing of American Pharmacy. This convention met, and, after transacting the business on the Drug Inspection Law, organized the American Pharmaceutical Association, and adjourned to meet in Philadelphia, in 1852, as the American Pharmaceutical Association.

In 1820 the first Pharmacopœia was published by a convention of delegates from medical societies in the United States, to which a small representation from pharmaceutical organizations was admitted; but it was essentially a convention of medical men, controlled principally by Philadelphia influence, perhaps rightfully. The convention published a very small edition of the United States Pharmacopœia, which became authority for Wood and Bache's Dispensatory, a very excellent work which took the place of the Pharmacopœia, and became the guiding authority of the apothecaries throughout the country.

The Pharmacopœia was virtually suppressed and unknown to the apothecaries. The formulæ were all incorporated into the Dispensatory, which was a private publication; as it was virtually absorbed and used as authority by the Dispensatory, it was argued that it was useless to publish a popular edition of the Pharmacopœia, because it was all in the Dispensatory. It is evident that the apothecaries had but little to do with it.

The American Pharmaceutical Association commenced for active work, appointed committees for the collection of statistics and information relating to all departments of Pharmacy, solicited papers upon all matters relating to Pharmacy, and sent circulars to all parts of the country. Very few of these, however, were answered, and but few people were found that cared to take an active part in the work of the Association. Every one seemed to think that his particular section was worse than any other for social, scientific, educational, or even business co-operation. A general pharmaceutical apathy seemed to hang like a pall over the whole drug trade in every department. Very few were found who were willing to give to or receive from their neighbors anything in their line of business. A committee in the Massachusetts College of Pharmacy was raised, to draw up a new code of ethics, by-laws and constitution for the college by way of reorganization. One of the committee who was in a position to see many of the apothecaries in Boston in a business way, undertook to ascertain the animus of the retailers upon these pharmaceutical questions. He catalogued the names of all the apothecaries in the city and vicinity, and interrogated each one, calling personally upon those with whom he was not acquainted, and noting the answers opposite the names of each. He then tabulated the answers, and found five that were ready and willing to do anything in their power to create and maintain a college, to elevate the

standard of pharmacy in Boston: five more that would be willing to accommodate and aid, but did not care to take an active part; and ten more that wanted to know how it would benefit them, and would be willing to be enrolled as members. The report was laid before the Board of Trustees and discussed. It seemed to be a very discouraging outlook, and it also seemed to represent the animus of the whole country, as far as could be judged from the correspondence with other sections. The small gathering was unanimous on one point, namely, that something should be done to create a new order of things. Under such circumstances it was thought impossible to get enough together even to organize, and if a sufficient number were found, there would be none to speak nor do the work. All the old men had tried and given it up, and now positively declined to unite.

There was one man, however, who thought they had material enough to start with and thought they could devise a plan to make it a success even without meetings of the colleges for work, and that they could draft a constitution, by-laws, and code of ethics that would be acceptable and beyond factional destruction. Such a plan was made and adopted. All the old members of the college were enrolled as members. The oldest man of ability and respectability was made president. The vice-presidents were eminently respectable as pharmacists, but not energetic as workers. The other officers were unobjectionable. The five workers were put on the Board of Trustees, the remainder of the Board was filled from the five professed aiders. The officers of the college were ex-officio, members of the Board of Trustees, the Board consisting of fifteen members. Five members constituted a quorum for business, and ten members a quorum for business in the college. In the intervening time between meetings of the college the Board were empowered to act for the college, and the doings of the Board were read and approved at every meeting of the college.

The college elected the Board of Trustees and all the officers, and all of them held office until others were elected to fill their places. A record was kept of the attendance at every meeting and the changes were made from those that gave the least attendance. The plan worked admirably. The Board of Trustees were united in the work, acted as a unit, and were able to act freely and promptly in conference with other colleges and associations according to their ability. For about fifteen years the college was managed on this plan, without an educational school, although it had courses of lectures in the winter attended by apothecaries and their assistants. It was gradually educating professors of pharmacy from the ranks of pharmacists, and when the time came to open their school they were equipped for good practical work. The college did not believe in a theoretical university education without practical experience in a regular pharmacy and laboratory, and required a full four years' course of instruction with a reputable dispenser in addition to the full course of instruction in a regular college of pharmacy in order to obtain the degree of Ph.G.

The reason for selecting this college as a typical representative is not because it is any better or doing better work than twenty others in the United States, but because it has passed through all the trials, temptations and discouragements of a premature birth and a successful regeneration, and has raised its standard as high as any of its sister colleges.

There are about forty colleges and schools of pharmacy now in the United States, and about half of them require the same instruction that the Massachusetts college does to graduate. The other half graduate on a theoretical university education, more or less practical, without counter or working pharmaceutical laboratory practice. Although the education received in these schools is considered very good, their diplomas are not considered of value equal to those of the regular colleges, and are not recognized as such by them.

It would be difficult to make the pharmacist of to-day understand the difference between pharmacy as practiced now and fifty years ago; but facts can be cited now from living witnesses to show some remarkable changes. In the olden time, when the United States Dispensatory was considered authority, a prescription was taken to a very respectable apothecary, written plainly by a first-class physician, for a cough and sedative fever mixture to be administered to a very restless child. The servant was directed to take it to a certain apothecary a little distance away, but took it to a nearer store. The medicine was given to the child. The child became more restless all night, and the fever increased. The prescription with the medicine was taken in the morning to the certain apothecary to ascertain if it was compounded correctly, or if some mistake had been made. The apothecary said that he thought it was compounded correctly from the preparations made in that store, but if he had put it up it would look entirely different. The answer came, "Well, now you put it up, and let us see what the difference is." The apothecary did so. The medicine looked quite different. It was administered to the child, who was relieved and quieted, and soon went to sleep. The father said the medicine had just the effect the doctor said it would, but he could not understand how two apothecaries using the same book for compounding authority could make mixtures to produce opposite results.

The first Pharmacopœia of 1820, planned by the medical profession in a convention called for the purpose, did not appear to be entirely harmonious. It appears to have been controlled by Philadelphia influence; was edited, compiled and published in Philadelphia, presumably to be used as authority for Wood and Bache's Dispensatory. The plan agreed upon was to publish a new edition every ten years by a convention of delegates from medical societies, and a small representation from pharmaceutical societies. Philadelphia had some good apothecaries who assisted the physicians in the work of arrangement, looking after the formulas, etc., but the edition published was so small that very few apothecaries in the coun-

try ever saw a copy of the work. There was no demand for it, and it appears to have been a local affair, not satisftory to many outside of Philadelphia. It was so unsatisfactory, in fact, that Dr. Jacob Bigelow, an eminent physician in Boston, and one eminently competent to judge of the merits of such a work, published a sequel to it, called "Bigelow's Sequel to the United States Pharmacopœia," which must have had a larger circulation than the Pharmacopœia itself. Owing to the state of the drug trade at that time, there was very little interest manifested by the apothecaries in either of these books, presumably and simply because the time had not come for them to act. They appear to have been satisfied with the United States Dispensatory. Thatcher's Dispensatory and other authorities were being displaced by it.

In 1830 the Pharmacopœia Convention met for a revision, which put the work into the hands of a committee for final revision, passing over all the papers and suggestions made to the convention with some instructions for their guidance. 1840 and 1850 seem to have gone in the same way. In the mean time the colleges of pharmacy had been appointing committes to revise the Pharmacopœia and propose plans to the Convention for its improvement, as all the societies who sent delegates to the Convention were invited to do. In 1860 the pharmaceutical colleges were well but not numerously represented in the Convention.

On the first day a committee was appointed to draw up a plan for the revision. The members of this committee were three or four physicians and two pharmacists, who were to report the plan to the convention at ten o'clock the following morning. The two pharmacists were present, but none of the physicians put in an appearance. They waited an hour and then consulted as to whether they should report to the convention, no quorum being present for business, or should go on and draw up the plan. It was put to the vote and unanimously decided to do the work and report. One was elected chairman, the other secretary; half the working force of this committee was from Philadelphia, and they unanimously agreed to some very radical changes. They abolished measures of capacity and recommended that every formula should be expressed by weight and parts by weight, to make a uniform standard for all things in compounding; that the committee of final revision should be a large one, from different sections in the country; that it should meet in Philadelphia, and that the Pharmacopœia should be published in that city. The report was signed by the Chairman and Secretary, and was somewhat of a surprise to the convention, but it was discussed and accepted by sections and items, and a motion was made to recommend the Committee of Revision to publish all the formulæ expressed by weight and parts by weight. It was amended by erasing the word *recommended* and inserting *instruct* in its place as the sense and intention of the convention. Dr. Wood, of Wood & Bache's Dispensatory, kindly offered the use of his library and study for the meet-

ings of the Committee of Final Revision, and was elected Chairman. But Wood & Bache's Dispensatory, after doing so much good to the profession of pharmacy, now stood directly in the way of progress, and the Pharmacopœia was published with the old measures of capacity and weights, as usual, the vote of the Convention being entirely ignored.

During the decade from 1860 to 1870, the colleges of pharmacy became well informed and powerful, and the American Pharmaceutical Association became an authority and power in the land. They appeared in force with their proposals for revision of the Pharmacopœia, and had men competent to suggest, advise and do the work of radical revision. The Pharmacopœia convention re-enacted their former vote, making the radical changes, completely upsetting the old formulas and methods in the Pharmacopœia, requiring a new edition of the Dispensatory, creating the competition of a new Dispensatory, upsetting the methods, weights and measures, and pharmaceutical authority of every pharmacy in the country, and rendering the old books and private formulas useless. The doings of this convention became a success, and finally brought the physicians, pharmacists, colleges, wholesalers, retailers, manufacturers, compounders and dispensers into line, paving the way of future progress in every department of medical, pharmaceutical, commercial, economical, scientific, theoretical and practical methods. The time had come to do this work, and time has demonstrated the necessity of making the changes that have promoted united effort and social unity between all the allied interests, each department having separate organizations, recognized as helpful and respected by the others.

The pharmaceutical body thought it necessary to define their idea of professional intercourse between the physician and the apothecary. This was adopted and published in the Proceedings of the American Pharmaceutical Association in 1858, after a long discussion. It was thought by many at that time to be too radical, but as no objections have been made to it it is presumed to be quite conservative for the present time.

This paper is intended to state the history of American Pharmacy as a thing of itself; no names of founders are mentioned, nor glorification of persons is intended. All that is omitted, not because it is uninteresting, but because this is a jubilee of events to show our glorification in the progress we have made in the world's progress during this century, and mostly in the last half of it, not as individuals or citizens, or even as Associations, but as pharmacists—formerly apothecaries—in the hands of the Almighty, having each a definite work to do in his vocation, in His kingdom of uses. We show the condition we were in—in the beginning—so to speak. We show the difficulties we had to overcome and the obstacles that had to be removed. We went forth bearing precious seed into the wilderness, on the hill-tops, and into deep valleys; and we have come back, bringing our sheaves with us to a large place, where the mountains are laid low, the valleys filled up, and the rough places made smooth; to spread ourselves

on this broad prairie, where all are on a level; to compare ourselves with other workmen in this millennium day of God's great work, living in the acknowledgment that every good thing we receive cometh from His hand, acknowledging our weakness, and imploring His aid continually. That we have received His aid we realize, knowing that the work is His, not ours, and as laborers in His vineyard we bring in our sheaves, and pile them up in these buildings as monuments of our labor. In comparing us with our fellow-laborers in the world, we are willing that you should say whether we are abreast of the times or unprofitable servants.

In this history we do not portray our present condition of prosperity. Each of the colleges and schools of pharmacy has a prospectus and programmes of its own, obtainable as desired. We are not ashamed to own the poverty and weakness of our hereditary gifts, nor afraid to show the progress of our infantile development. Our work is on a par with all that we see upon the grounds to-day, from the discovery of Columbus to the spread of Chicago. We are simply in the line of development of this little world which it has taken our Creator many years to make, and He has saved one-half of it for this time and this people. There is no fence around it, no king to rule it, no church infallibility. We have all the liberty we can utilize; our divine rights come direct to the people, and our doors are open to all; our rising sun shines upon us a symbol of the source of all good from the East; the setting sun illumines the Golden Gate of the West, a united people in United States, "a church without a bishop, a State without a king."

THE CHAIRMAN: If any member desires to make any remarks upon this very interesting paper, it will be in order.

MR. MAJOR: I notice the gentleman doesn't incorporate anything in his paper about the progress of the saloon during this time.

MR. ELIEL: Mr. Chairman: I desire to say in my own behalf, and I believe I also voice the feelings of the majority of the ladies and gentlemen present, that the remark which has been made by a member of this Association—and I am sorry to say that he is a member—is one which is an insult to this Association, and one which no gentleman would make. I desire to say further, that I propose to bring charges against this member at the next general session of the American Pharmaceutical Association on Saturday morning.

MR. MAJOR: In reply to the gentleman's remarks, I would say that I am willing to apologize for anything I have said, but my remark was only intended as a joke.

THE CHAIRMAN: Mr. Major is out of order. This is not the place to discuss the subject. The reading of papers will be resumed.

Mr. Patch read the following paper:

PAPER PRESENTED TO SECTION ON LEGISLATION AND EDUCATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, CHICAGO, AUGUST 14, 1893.

BY E. L. PATCH, BOSTON, MASS.

The questions propounded by the committee of this Section are so practical in their character that proper answers would yield us much valuable information. Personally we feel unequal to the task of giving them the close attention they merit, but after repeated solicitations we venture a few random thoughts.

LEGISLATION AND BOARDS OF PHARMACY.

1. What are the benefits, and what, if any, the losses to the community and to pharmacists, by reason of the existence of the Pharmacy Laws?

Among the benefits may be mentioned: 1st. A deeper sense of the responsibility of the calling impressed upon the public mind, and, incidentally, a better appreciation of pharmacists. 2d. Greater attention given to study and preparation on the part of assistants through a desire for early registration. 3d. Better compensation for the earnest and thoughtful who earn registration.

A possible loss or drawback may be that the registration of assistants and proprietors on the same terms encourages a sentiment of over-confidence on the part of some young men, and by stimulating the multiplication of stores, from the legal assumption that one registered person is as qualified to open a store as any other, induces over-competition.

2. Would it be a gain or loss to pharmacists to compel apprentices to pass a Board of Pharmacy examination on their general education before permitting them to begin work in a drug store?

If it were practical to exclude from pharmacy at the door of entrance all but the educated, it would certainly elevate the standard. It is a question if such a possibility exists. If a high school graduation standard was required, it would imply an average age of 19 years. At that age few young men feel like giving their time to the scrub work of a drug store, but are impatient to place themselves where their knowledge, which just then appears to them a very large capital, can become more quickly productive. In many cases such a young man still has the privilege of choice, and he often elects a higher education, or chooses a purely professional career. Broad-minded parents are capable of studying the statistics of pharmacy, and arrive at the conclusion that its gains do not compensate for its risks, its responsibilities and restrictions. The greatest number of apprentices come from among boys 15 years of age and upward, who are denied the privilege of further attendance at school, and enter pharmacy, attracted by a false conception of the labor involved and its possibilities for gain, or impelled by its semi-professional and scientific aspects. Even so, it would be well that each applicant for the position of an apprentice

should demonstrate his qualifications, and such should be treated as apprentices and aided in all efforts to acquire knowledge, but not kept dealing out cigars, dispensing drinks, and scrubbing until the edge of all desire for attainment is completely worn off. Possibly such an examination might stimulate a better class to seek admission to the ranks, on the principle that the greater the obstacles interposed the higher the quality of mind that enters the struggle.

6. In several States only graduates in medicine can come up for examination and registration as qualified physicians. How would a similar law operate in pharmacy?

7. Should graduates in pharmacy be compelled to pass the examinations of boards of pharmacy before being registered?

Registration should not be dependent upon graduation from schools of pharmacy. It is well known that with high natural endowment of intellect and ambition, favorable store surroundings, an able employer and facilities for self-instruction, a higher grade of assistant may be evolved than can be produced from an indifferent character, intellect tobacco or beer blunted, narrow practical experience and third-class college instruction. The principle of this century's life is to give every boy and girl, every man and woman, an equal chance, and debar none from filling any position the world has to offer because accident or environment has prevented their conforming to a set course of training. If they can demonstrate their ability to meet its responsibilities and discharge its obligations, nothing more should be required.

Some can do more with an hour a day given to self-culture than others with ten hours and the aid of instructors. Too often the routine of class instruction has destroyed originality and dwarfed personal power by developing a class of imitators. Yet we would not be understood as undervaluing the advantages coming from higher education in all departments, but rather as deprecating the undue consideration given to mere routine or method.

Graduates in pharmacy should be treated as all other applicants. It is the office of the Board of Registration to personally determine the practical fitness of the applicant, not to decide upon the method of achieving that fitness, and not to accept the prejudiced recommendations or evidences of anybody outside itself.

It is constituted, engaged, sworn and paid to pass personal judgment, based upon personal knowledge, and not hearsay testimony. If the Board is so made up that it is not capable of doing this, it is the State's misfortune.

8. What would be the gain to pharmacy and the community if the law forbade the sale of patent medicines by unregistered persons?

It does not require technical skill or manual dexterity to handle patent medicines. In many cases it does not require mercantile acumen

or versatility, the demand having already been created at great cost by the proprietor.

Any legislation restricting the sale of simple merchandise to a person, or class of persons, is class legislation, or state favoritism, and is opposed to the principles of personal liberty of action guaranteed us on all right lines.

The mercantile side of pharmacy must be subjected to the universal laws of all mercantile pursuits, such as supply and demand, competition in trade, facility for effecting sales, and power for low purchase and favorable terms, secured by capital and superior credit.

If the time we have given in the past to discussing this question and advertising our dependence upon the profits of the patent medicine trade, had been given to the cultivation of the sale of those goods less liable to outside competition, and to fostering a spirit of unity among pharmacists themselves, we might have reached more favorable results. Trade is merciless and selfish, and we cannot expect others to throw into our hands an added profit on pure merchandise that can be as readily sold by the young girl at the dry goods counter as by the Ph. G. in the drug store. The friendship of the great public is measured by the "most for the money" principle, and the search for "bargains" will continue to be a ruling passion for some active merchant to gratify.

9. Should patent medicine makers be compelled to print upon each package the formula of its contents?

The publication of formulas with unrestricted sale would not be an unmixed good

Imagine the advantage to B.'s bitters with the published formula: Gentian, 1 part; yellowdock, ½ part; burdock, ½ part; syrup, whisky and water to make 100 parts. Opium antidotes containing half a grain of morphine to a fluidram would be more eagerly sought for than at present if their real composition was known.

Then it is a serious question whether the public would see such marvelous cures if the composition of the remedy was known. The quackery of the gold cure for inebriety shows what powerful factors imagination and faith are in the cure of disease.

12. Should Boards of Pharmacy publish from time to time, in the pharmaceutical press, their past examination questions, as a guide to future candidates of the nature of the subjects upon which they are expected to pass?

The publication of examination questions used by Boards of Pharmacy and Colleges of Pharmacy undoubtedly serves to stimulate some to acquire a certain amount of special knowledge or to store up certain facts. This is much better than ignorance, but if this temporary and superficial acquisition secures the end of registration and satisfies the ambition of the applicant, it may prevent the securing of the broader training that fits for each emergency Yet it is not improbable that the struggle to master these isolated facts may arouse in some a desire for deeper knowledge.

11 Produce an ideal set of examination papers for a Board of Pharmacy, and give the principles guiding their construction.

An ideal set of questions for one section and at one time would be very faulty under other conditions The one principle of learning whether or not the applicant has proper knowledge to be safely entrusted with the care of a store, should actuate all examinations. A fool can ask questions a wise man cannot answer, but it takes a very wise man to put questions that will elicit intelligent answers from a fool. In our intercourse with Boards of Pharmacy we have usually met with practical, sensible pharmacists, whose aim is to faithfully perform the duties of their office, and not to needlessly uncover the ignorance of the applicant upon points they might never have occasion to meet, and so display their own folly. We have had sent to us drug samples for identification that would seem to indicate that some Boards are not as judicious in this respect as others. We cannot judge or condemn, for the sample in question may have been shown for the purpose of exciting curiosity, and not for marking the qualifications of the candidate. We recently had samples of areca nut and cashew nuts sent us as having been submitted to the candidates for identification. The possibilities coming from the examination of the latter are serious in the extreme. A lady student in one of our classes had several sent to her from abroad, with the statement that the kernels were good eating, and were employed in puddings, etc. She bit into one and was badly poisoned After quite a period of suffering she desired to examine into the matter, to isolate the acrid principle and learn the best method of treatment. We secured for her samples of W. I. nuts from anacardium occidentale and samples of E. I. nuts from anacardium orientale, or, as later authority gives it, semecarpus anacardium. We submit specimens of these varieties and of the cardol separated from them by Mrs. Ida Brigham.

Ordinary descriptions refer to the seed as white, mild oily, edible, but also call attention to the acrid, oily body, cardol, $C_{21}H_{26}O_2$, found in the pericarp and employed as a rubefacient and caustic, used as a remedy for corns, warts, ringworms and ulcers, as also to apply to the face to remove the cuticle and "produce a youthful aspect." Cases of serious poisoning from exposure to the fumes of the roasting nuts are on record, and the appearance chronicled is anything but "youthful." Cardol becomes black by exposure, and hence the synonym "marking nut" and the use of cardol by painters to give their colors a permanent black. From our experience at the time of Mrs. Brigham's assays, we learned to consider a weak solution of iodine as a ready remedy to arrest vesication. Hence on the receipt of the specimens smuggled by the candidate and sent for examination, we did not hesitate to confirm our identification by touching to our wrist the knife blade used for cutting into the nut. We used care not to puncture the skin. In due time the vesicular irruption appeared, and we painted it with iodine. To our surprise, it had no ap-

parent effect, and the eruption rapidly extended. We applied the common remedies for ivy poisoning, as Sol. Chlorinated Soda, Sol. Tersulphate of Iron, Grindelia, etc., but the inflammation steadily progressed until it involved the hand and forearm. To prevent its extension to the body, we encircled the arm with Iodoform Collodion, but the inflammation became constantly more severe. We sprayed the surface with 5 per cent. solution of hydrogen peroxide, and covered it with cloths wet in benzothymol solution mixed with almond cream. This reduced the external inflammation, but pockets of pus had formed in the sub-cutaneous tissue, and no relief was had until the knife had been freely used. The scars still carried, after the lapse of several months, remind us that our practical demonstration was complete.

Many years ago we handled poison oak with impunity, but there came a time when we were severely poisoned by it. We thought our experience then gained would enable us to cope with any similar case, but will be inclined to be more conservative in our views after this. However, it may be of service to some to call attention to a very successful course of treatment pursued by Dr. F. E. Park, of Stoneham, Mass. He prepares a resorcin gelatin by mixing resorcin, one-half ounce; gelatin, five drachms; glycerin, one ounce; distilled water, two ounces. This is liquefied by warming, painted over the entire surface involved, allowed to remain twelve hours, washed off with warm water and renewed each twelve hours until a cure results.

The possibility of a candidate for registration in pharmacy being poisoned by the examination of samples submitted, should be carefully guarded against by the use of every precaution.

We are often told that one of the weakest points in the examination is the lack of knowledge of the physical appearance and characteristics of crude drugs, chemicals and preparations. It has sometimes occurred to me that the candidate, in his store experience, coming in contact with pressed herbs, ground and powdered drugs and powdered chemicals, may not have had opportunity of seeing whole specimens. Even if he has had his attention called to them at some college of pharmacy, it is only one item among hundreds presented to him, and does not become a matter of daily experience, hence he soon forgets them. As a means of ascertaining the desire for knowledge, the habits of observation and care, the range of experience and power of comparison possessed by a candidate, it is undoubtedly well to have this feature of the examination well sustained. But the specimens should consist mostly of such as are reasonably likely to come within the reach of ordinary retail experience. They should be average specimens, and not abnormal in size, shape or color. They might include among drugs,—aloes, asafœtida, acacia, arnica flowers anise seed, aconite leaf, aconite root, benzoin, bloodroot, buchu, cardamom, cubeb, Roman chamomile, German chamomile, cinchona bark, cascara bark, cas-

carilla, cinnamon, chimaphila, calamus, celery seed, columbo, caraway, coriander, clove, cochineal, colocynth, canary seed, Canada snakeroot, dandelion, digitalis, ergot, fennel, flaxseed, gaultheria, gentian, ginger, guaiac, gamboge, hops, Irish moss, ipecac, Iceland moss, juniper berries, lovage, licorice, lycopodium, manna, myrrh, marshmallow root, mustard, opium, orris, quince seed, rhubarb, rose leaves, sarsaparilla, senega, squill, serpentaria, senna, safflower, saffron, sassafras, sumac berries, tragacanth, tonca beans, uva ursi, wild cherry and vanilla.

A secondary list, on which marking should be more lenient, might include ammoniac, belladonna root, belladonna leaf, blue flag, cassia fistula, cocculus indicus, cannabis indica, cowhage, coca, cotton root bark, cypripedium, curcuma, conium leaf, conium seed, castor, calabar bean, dragon's blood, damiana, eucalyptus, fenugreek, goldthread, galangal, golden-seal, grindelia, galbanum, hyoscyamus, ignatia bean, jalap, kooso, lactucarium, lavender flowers, larkspur seed, mastic, marigold flowers, male fern, nux vomica, pink root, peppermint, red clover, spearmint, stramonium leaf, triticum.

A third list might be on exhibition, but to expect a majority mark on their identifications appears to be too great an exaction. It includes areca nut, bael fruit, buckthorn berries, French and German, castor-oil leaf, castor-oil bean, cashew nuts, curcas or purging nut, croton seed, cacao beans, euphorbia pilulifera, Chinese and Japanese galls, Job's tears, jambul, kamala, kola, manaca, myrobalans, orange flowers, pomegranate rind, pomegranate root bark, pichi, pellitory root, persimmon, salep, senna pods, sumbul, tormentil, veratrum.

Samples of chemicals should be such as can be identified by physical appearance, as crude sal ammoniac, sulphate of iron, sulphate of copper, iodoform, iodine, tannin, ferrocyanide of potassium, ferricyanide of potassium, carbolic acid, iodide of lead, permanganate of potassium, sulphate of manganese, valerianate of ammonium, valerianate of iron.

A candidate should not be expected to distinguish between borax, sodium phosphate, sodium carbonate and sodium hyposulphite in crystal or powder from physical tests, but might be asked for simple chemical tests for their identification. The same might be said of the group oxalic acid, epsom salt and zinc sulphate. Also of the group quinine sulphate, morphine sulphate and salicylic acid. Also powd. strychnine sulphate, cream of tartar and powdered milk sugar.

When we come to galenical preparations we must be still less exacting. So many are similar in color and near in odor that one is easily led astray. We have known examiners to be unable to distinguish between fluid extract of ergot and fluid extract of dandelion when the corks had been shifted. Other parallels might be given. Such samples should be restricted to truly characteristic specimens, as laudanum, (identified as some opium preparation,) paregoric, aromatic spirit of ammonia, spearmint

water, oils, tincture of gentian compound, tincture of rhubarb, syrup of wild cherry, syrup of squill, syrup of tolu, etc.

EDUCATION AND COLLEGES OF PHARMACY.

1. Give a set of rules for the government of students at colleges of Pharmacy.

But one rule is necessary: "Students are expected to be *gentlemen*. Failure to observe this rule will be met by prompt expulsion from the classes of this college without recourse. Each professor or instructor in charge has full power to secure its enforcement."

For the sake of the thoughtless and indifferent, this rule is explained to mean:

1st. Each student is expected to give to his fellows and to his instructors the polite consideration one gentleman gives to another.

2d. *Gentlemen* will not injure or destroy the property of another, but will hold it more sacred than their own. They will consider that property acquired by collective effort, and paid for by public contribution for public good, should, if possible, be better cared for than so-called private property, that its beneficence may be extended to others, and its highest good continuously enjoyed by a greater number.

3d. *Gentlemen* do not deface places of public resort with expectorations, tobacco spit and smoke.

4th. *Gentlemen* give attention to any speaker, and do not rob their neighbors of the privilege of listening by any show of inattention, whispering, laughter, or other rude interruption. Criticism and dissent are reserved until the speaking is concluded.

5th. *Gentlemen* are honest. They win scholarship by *attaining* knowledge, and do not gain marks by the temporary theft or borrowing of facts from others, or by the use of "ponies" and "cribs." It is never necessary to expel them for cheating during examinations.

OBSERVE.

It is to the mutual advantage of this College and of every student that we maintain the character of gentlemen. Such teachers are most helpful, such students are most receptive, and together a higher standard of excellence is maintained.

NOTICE.

We do not forget the presence of lady students, but having so far observed among them nothing but the most lady-like deportment and earnest ambition for knowledge, we omit reference to them in our rule.

2. Why do so many pharmacists forsake their profession for the study and practice of medicine?

Pharmacists leave pharmacy for the practice of medicine because they think the latter presents to them greater social, intellectual and pecuniary opportunities than can be gained with the close confinement to small de-

tails of a business of detail narrowed by localized surroundings, hampered by sharp mercantile competition, and shut in from broad intercourse with the outside world.

4. Give some of the most amusing blunders made during examinations in Colleges of Pharmacy or Boards of Pharmacy.

A few among many:

1. "Dehydration is the throwing out of salts."

2. "Calcination is the adding of two bodies which will cause decomposition."

3. "An emulsion is the process of emulsifying or adding to oils or fats by adding to make them of equal distribution, first by adding part in a mortar and then the rest."

4. "An infusion is a confusion of solid to liquid by means of heat."

5. "A syrup is a placid solution of sachrine, water or substances."

6. "A tincture is an alcoholic solution of the erginious of medican substances."

7. "Iron spatchlers should be used in weighing substances that eat."

8. "Fusion is a process of boiling drugs in water to extract its virtue."

9. "Filtration is passing a drug through a menstruum to extract its virtue."

10. "Decantation is a process of obtaining a medicant by placing a solid and solvent together, thereby obtaining a residue and then pouring off the liquid."

11. "The standard of English waits and measures is the inch, taken from a pendulum ticking seconds at the bottom of the sea."

5. How can dull and lazy students in colleges of pharmacy be kept as near as possible abreast of the work done by the intelligent and diligent?

By great injury to the intelligent and diligent. Lowering the standard of attainment and giving out the minimum of work. Do not try it! Work for the best men in the class; give them all they can bear, and perhaps a trifle more, (anything gained without effort is an injury, as it fails to bring development of increased power,) and let the "lazy" lag behind. Make special effort to help the *dull*, and stimulate them to increased application. One strong character, highly trained, may be better than many partially developed.

6. How can colleges of pharmacy be placed upon a purely educational basis, instead of being conducted for the money they can make?

1. By the drug trade of each section giving annually one-fourth the sum now expended for associational entertainment and commercial interests to the establishing of an endowment fund for the nearest college of pharmacy, the income to be devoted to practical instruction.

2. By securing state endowment and the interest of State boards of education.

3. By placing the control in the hands of broad-minded, liberally edu-

cated men outside of pharmacy, who shall act with an advisory board of pharmacists, thus diminishing the petty, boyish jealousies that are entertained by fellow-craftsmen against those who are prominent workers in pharmaceutical education.

4. By securing as teachers men interested in *teaching*, and if possible securing them from want—men divorced from "the greed for gain, the thirst for power," yet ambitious for high attainment and steady progress.

7. Should any candidate be permitted to graduate in pharmacy before he is able to apply the tests and assays of the United States Pharmacopœia?

No!

11. Should candidates for graduation in pharmacy not be able to make all preparations, a process for which is given in the United States Pharmacopœia?

On the scale of the United States Pharmacopœia process they should be able. On the scale of practical manufacturing, they may not be able.

MR. BLACK: In reference to the humorous answers to questions with which Mr. Patch has illustrated his remarks, I may add another specimen for the same purpose. At one of our examinations the following questions were asked: "Is air a chemical compound or a chemical mixture, and of what is it composed?" The answer was: "Air is an insoluble substance in aqueous solution." Now if you can beat that, I should like to know it.

MR. BARTLEY: There is one point in this paper that I would like to emphasize rather than criticise, and that is the reply to the second query. Registration, the author says, should not be dependent upon schools of pharmacy. At the close of that paragraph, he says that Boards of Pharmacy are paid and sworn to examine and register pharmacists. I myself happen to be a member of a Board of Pharmacy, and this idea agrees with my experience, except as to pay; the pay is not included in our report. But I am strongly of the opinion that no one should be licensed to practice pharmacy without an examination. I believe in Mr. Patch's theory when he says that a Board of Pharmacy has no right to register a person without an examination. If I understand the paper correctly, it states that Boards of Pharmacy are expected to carry out the law which they are sworn to perform, and that the law determines the qualifications which entitle a person to registration. For example, I have read the act of this State (Illinois) as published by the State Board, and I find that if a young man comes up and can give satisfactory evidence of five years' experience in a drug store, the law leaves no choice to the Board of Pharmacy, which must register the applicant. In our own State (New York) we are obliged to register every man who presents a diploma from an incorporated school of pharmacy, and have no choice in the matter. If we do not register him, he can compel us to do so through the courts. These differences in the laws of the various States are, of course, somewhat confusing to a person who goes from one State into another. It seems to me that some action ought to be taken by this Section, through a committee, with a view to defining a general line of policy in such matters. The mere presentation of this paper is very good in its way, but at the same time it does not necessarily voice the sentiment of the whole Section or of the whole Association. If the Association could decide upon some plan to be recommended to the different States in the way of legislation, it might amount to something, but a discussion without a recommendation cannot give any idea of the sense of the Association. It merely shows the opinions of a few members. The views expressed by the author of the paper are, in my opinion, eminently correct, but they do not in any way commit the Association.

MR. HALL: Some ideas have occurred to me in listening to this discussion, although I came in too late to profit by Mr. Patch's able paper. The gentleman who has just spoken was discussing, I believe, the question of how colleges of pharmacy may be placed on a purely educational basis, instead ot being employed for the money they can make. I am under the impression that all the colleges of pharmacy in the United States are owned by private corporations, are they not?

THE CHAIRMAN: No; that is not the case.

MR. HALL: The college of pharmacy that we have in the Prov nce of Ontario is owned by the druggists of the Province, and is incorporated under an act of Parliament.

THE CHAIRMAN: In the United States there are a number of colleges of pharmacy under the control of the State.

MR. HALLBERG: If I may be permitted to answer the gentleman's question I would like to do so, inasmuch as I have some statistics here. There are twenty colleges conducted by the druggists' organizations, while six are departments of State universities. There are from fifteen to twenty more which are either private institutions, departments of business colleges, or private institutions connected with a university that is not a State university.

MR. HALL: We have a monopoly of teaching pharmacy in the Province of Ontario. All graduates must attend our college. They are, in fact, compelled to do so, and the profit that we derive from the teaching department we use to enlarge and more fully equip this department. I would add that we are devoting more than one-half of our time to practical work. I believe that is a phase of the discussion that the Chairman started in his address. We are developing particularly along the line of practical work, and as I have stated, within a few years we have so developed that feature of our college that it is getting to be eminently a practical college. I thought there might perhaps be something in this from which a committee might get some ideas.

THE CHAIRMAN: In the work of progress it is always well for every college of pharmacy to know what every other college is doing. Progress is always a growth, and the only way to grow is to take up the good that you find in others and discard the bad that you find in yourself. If all the colleges were to emulate each other in all the good points, and not be afraid that by taking up something that some other college has they would be simply imitating and praising it, but would each look for the good they can do to their own students, it would be better for pharmacy. That is the proper course to follow.

MR. SAYRE: It has been suggested that a committee should be appointed to define a line of policy to be recommended by this Section with reference to the examination of graduates in pharmacy and in regard to their admission to pharmacy without examination. I think the point is well taken, and should not be passed by without consideration. I therefore move that a committee of three be appointed to consider this question and report thereon at another session. I would like to have that matter considered, and if there is any way by which we can entertain a motion of this kind, I would like to have it done. I therefore move that a committee of three be appointed, to report at another session on the advisability of examining applicants for registration.

The motion was seconded and carried.

The chair appointed as said committee Messrs. Slack, Sayre and Conrath.

Before the session was concluded, Mr. Sayre, on behalf of this committee, presented the following report: "It is the sense of this Section that the best interests of pharmacy would be subserved by a non-recognition of diplomas by State Boards, and that there should be no difference in the treatment of applicants for registration in pharmacy, whether graduates or not."

On motion, the report was received and adopted.

MR. JAMIESON: I desire to state, for the benefit of the gentleman from New York, that the law of Illinois is not exactly as he has stated. Section 1 of the law gives the Board of Pharmacy the privilege of registering on time qualification, namely, five years; but it is not compulsory on the Board to register either on five or fifty years, unless satisfied from the evidence presented that the applicant is a qualified pharmacist. All that we seek to do is to find out whether an applicant is well qualified. It matters not where he has obtained his knowledge, nor the length of time it has taken him to do so.

MR. WHELPLEY: Before leaving this subject I desire to refer to a part of the paper which dealt with the matter of common drugs or familiar specimens. The question is, what are familiar specimens? I find that examiners, in a number of Boards of Pharmacy, when preparing for an examination, go round their own drug stores and pick out a collection of specimens familiar to themselves and their particular trade, and present these at the examination. Applicants from the same town or from places where an entirely different trade is conducted may not recognize as familiar specimens half the number employed by the examiner. I believe that those Boards which follow the plan of applying to a wholesale drug house that supplies the State with drugs, and obtaining a hundred or more drugs which the wholesale house principally sells, is the one that comes the nearest to supplying familiar drugs for the examination. This is a practical point which many Boards of Pharmacy, to my own personal knowledge, have been accustomed to overlook.

MR. VERNOR: The Detroit Board of Pharmacy called a meeting of the Detroit Pharmaceutical Society for the purpose of having the druggists select fifty specimen drugs, but did not tell them for what purpose they were to be selected. When the druggists met, we asked them to pick out fifty specimens that they thought would be fair to give to the class, and they were unable, off-hand, to pick out twenty-five. They took up the trade catalogues, and in this way managed to increase the number to forty-eight, but they could not select fifty. Out of the whole number selected, I think they had three that we did not have on our list.

MR. REMINGTON: The remarks made by Mr. Vernor remind me that, last year, at the spring examinations, when one of the faculty of the college with which I am connected was taken ill, the students presented a petition asking that *they* might be allowed to frame the questions. [Laughter.]

THE CHAIRMAN: A paper that I wish to present to the Section now is contributed by the Chemical and Pharmaceutical Association Lombardini of Milan. It was originally written in Italian, but it has been translated by Dr. Charles Rice, of New York. The paper was taken to him for the purpose of securing a translator with his assistance; but he said it was easier to do it than to find some one else. This paper shows the condition of pharmacy in Italy, and is very interesting.

Mr. Hallberg moved that the paper be read by title and then referred to the International Pharmaceutical Congress.

The motion was seconded and carried.

Mr. William Simon, of Baltimore, read the following paper:

MODELS FOR ILLUSTRATING THE RELATIONSHIP BETWEEN GAS VOLUMES AND MOLECULAR WEIGHTS.

BY PROF. WILLIAM SIMON, BALTIMORE.

I have but little doubt that most teachers of chemistry have had the experience, that there is always a number of students who find great difficulties in comprehending fully the conclusions which we draw from a knowledge of the laws of Gay Lussac and Avogadro. In fact, those laws are but too often not clearly understood by students who have had no sufficient training in mathematics and physics.

In order to render these laws, and the bearing which they have upon the science of chemistry, more intelligible to my classes, I have used different devices; and after many years of experimenting, I have succeeded in constructing models which answer the purpose so well that it may be of interest to other teachers to become acquainted with them.

The models are meant to represent gas volumes of elementary or compound substances, and are to illustrate the alterations which take place in the volume of gases when undergoing chemical changes, as well as the relationship existing between these volumes and the molecular weights.

In order to accomplish this task it becomes necessary to construct models representing atoms, each one possessing a definite weight but a changeable volume; all models being, moreover, so arranged that either two or more of them may be fastened together, *i. e.*, combined into models of molecules, without change in volume. All this has been accomplished by constructing hemispheres which can be folded together in such a manner that either two or more of them may be fastened together, forming always spheres of the same size.

The construction of the models is as follows: To a round metallic frame (Fig. 33) of about five centimeters diameter, and made by joining two semi-circular pieces by means of hinges, is fastened a hemisphere made of cloth or leather, which may be folded up like an accordion bellows.

The frame also has a lock, which permits the joining together of two or more hemispheres, as shown in Fig. 34.

By using light or heavy material in the construction of the frames, the weights of the hemispheres are made to correspond to the atomic weights of the elements they represent. Moreover, a characteristic color serves to distinguish the respective elements. For instance: A black hemisphere representing an atom of carbon, weighs twelve times, and a green one representing chlorine weighs 35.4 times as much as a pale blue hemisphere representing hydrogen.

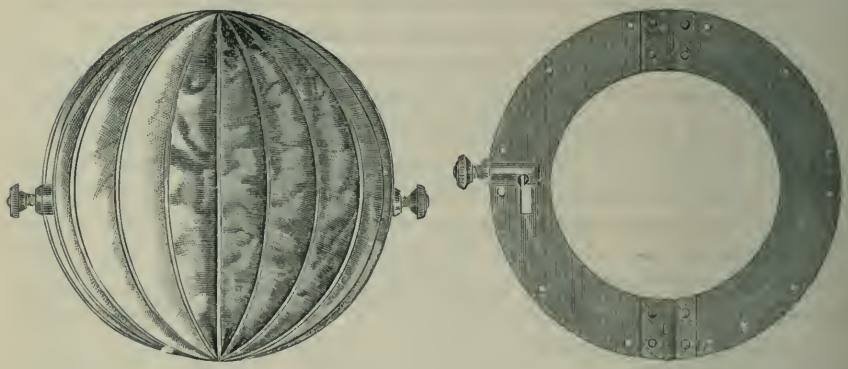
To illustrate, for instance, the change taking place when hydrogen and oxygen combine with one another, two glass cylinders of 5 centimeters diameter, and 15 or 20 centimeters high, are filled with models of hydro-

gen molecules, and a similar cylinder of the same size with the models of oxygen.

The cylinders, or rather their contents, are first weighed; and then the condensation into two volumes is brought about by joining each oxygen atom with two hydrogen atoms.

I am well aware that the use of such models very much recalls kindergarten instruction, but it is surprising to see how quickly even the indifferent student, aided by the models, grasps the underlying principle of the otherwise to him unintelligible ideas. And even to the more intelligent student the models have the advantage of facilitating his studies; as not only the laws mentioned, and all matters relating to chemical combina-

FIG. 33. FIG. 34.



Models for Illustrating the Relationship Between Gas Volumes and Molecular Weights.

tion by volume can be illustrated, but also such matters as the determination of atomic weights, and many other facts, may be explained by means of these models. The work of both student and teacher is thus greatly facilitated, and much time is saved.

It is needless to say that it is the teacher's duty to impress upon his students the fact that we have no positive knowledge whatever of the actual shape of atoms and molecules, and that the models must not be looked upon as representations of actual atoms and molecules in magnified form, but that they can be used only as a means of explaining and illustrating in a tangible way the conditions as we find them.

Finally I wish to say, that I have negotiated with a well-known firm, dealing in and manufacturing chemical and physical apparatus, regarding the manufacture and sale of the models; my only stipulation being that no patent shall be taken out, as I desire to have them placed at the

disposal of teachers and students at as low a price as possible, and also to stimulate others in improving upon this first crude attempt to illustrate by models the chemistry of gas volumes.

MR. PATCH: I think we should all be grateful to Mr. Simon for the presentation of these models. They meet a long-felt want. Eight years ago, after a great deal of thought and experiment as to how to present this matter intelligently to our class, we were obliged to spend hour after hour in personally constructing models. Our plan was to cut out a large number of cubes of wood that could be employed in illustrating the measurement of each weight. These cubes were all painted to represent the different elements, and on their faces was painted the symbol of the element and its atomic weight. In addition to that, we had molecular blocks, representing the molecular volume, and on the face of the molecular blocks was painted the entire formula for the combination. We found this method was extremely helpful to us in making plain to our students what had been unintelligible, and it far surpassed the use of the blackboard. Here, however, we have something that any one can obtain, which is far superior to our plan, but right in in the same direction, and our classes have certainly derived a great deal of benefit from our system during the past eight years.

MR. SLACK: I move that the thanks of this Section be tendered Dr. Simon for his generous gift of these models, and especially in view of the fact that there is no patent on the device. I have taught chemistry for many years, and appreciate the difficulty experienced in explaining the matters referred to. It is a very difficult subject to explain, and I think by the aid of these models we can do greater justice to it.

The motion was seconded and carried.

MR. HALLBERG: I think that object lessons on these subjects have not been sufficiently employed in our colleges. I think it is very important that these fundamental principles should be presented to the student in such a manner that he can easily understand them. Of course, various institutions have similar devices to the one described by Mr. Patch. I have, for several years, entertained the idea of constructing a chess-board with the various elements marked thereon, or something like checkers, and have the checkers labeled according to the elements, so that we can form a combination. For example, make one move of H, when it is confronted with two moves of O, two moves of H against one move of O, we have H_2O. That would be a game we might try. We continue until we run into one S, four O's, and thus produce H_2SO_4, or for example, bring about a combination which would result in carbonate of soda or something of that kind, and when that gets in contact with sulphuric acid there will be an explosion. Now, I believe that in this way we can get our young clerks so interested in chemistry that it would be a great help to them. Inasmuch as ideas are in order, I thought I would unburden myself on this point.

THE CHAIRMAN: I will state, for Mr. Hallberg's benefit, that such a plan as he has suggested was adopted in England more than ten years ago.

DR. BAKER: In Germany, chemistry has been taught by a ballet arrangement, by dancing figures of men and women.

MR. HALLBERG: But drug men cannot have a ballet, you know. (Laughter.)

MR. BARTLEY: I desire to suggest a little device I have employed in teaching the constitution of gases as a whole, and to show how heat operates upon them. I came upon it one day, when I saw a boy in a boarding school to which I was attached, strike another

boy with a ball which immediately disappeared. I hunted in the boy's sleeve, and found a rubber ball attached to an elastic string. I took it from him and found it an excellent thing in the lecture room to illustrate the action upon gases, by taking the elastic string and letting that represent the force of attraction between the molecules, and then by swinging it; the more heat you apply or the more muscular energy you apply to it, the further the ball swings from the centre, showing the expansion of the body under heat. If you allow the muscular energy to subside, the ball swings nearer to the centre and strikes as it cools off. If you wish to show the effect of the contact with the walls of the vessel, showing the path of the molecule, let it strike the table and it goes off in a different direction.

The following paper was then read:

WHY DO SO MANY PHARMACISTS FORSAKE THEIR PROFESSION FOR THE STUDY AND PRACTICE OF MEDICINE?

BY HENRY R. SLACK, M. D., PH. M., LA GRANGE, GA.

Have we any reason for asking this? Let us see. In considering such a question two methods of treatment suggest themselves to the mind: 1st, the speculative and philosophical, and 2d, the scientific and statistical. The former method is the more pleasant, as we are not compelled by it to deal with facts, stubborn things that will not always do our bidding, but we can excogitate from the inner consciousness theories to fit our fancies. This is the method of the philosopher, but since the time Lavoisier demonstrated the use of the balance in overthrowing the phlogiston theory of Stahl, this method has gradually given place to the scientific mode of investigation, *i. e.*, get your facts and then from them deduce your theory.

Believing this to be the correct way to arrive at the truth, I addressed the following questions to physicians who had been pharmacists in every section of the United States: "Why did you study medicine? Do you practice both professions? If only one, which? Do you consider the M. D. degree an advantage to a pharmacist? Enclosed find stamped envelope for reply." I was gratified at the result, for these gentlemen, with six exceptions, gave enough of their valuable time to write full and lucid replies. Some few of the letters were by mistake addressed to prominent pharmacists who had not graduated in medicine. They courteously replied, giving their views, and the mistake proved beneficial.

Now, I am fully conscious of the fact that truth can array herself in no more uninviting attire than a statistical table, but we must take the medicine in order to effect a cure. Statistics are to the economist what phenomena are to the scientist, and as this question is one involving professional economy we must study the causes that operate in the various sections of our great republic.

Of those who replied 60 per cent. had graduated in both medicine and pharmacy, 36 per cent. in medicine alone, but were licentiates in pharmacy, and 4 per cent. were pharmacists. Of the 60 per cent. graduates in both professions, $\frac{1}{2}$ were practicing medicine alone, $\frac{1}{3}$ were devoting their

energies to chemistry, $\frac{1}{10}$ combined office practice with chemistry, $\frac{1}{10}$ were practicing pharmacy alone, and the remainder were manufacturing pharmacists. Of the 36 per cent. who were licentiates in pharmacy and graduates in medicine, about $\frac{1}{2}$ were practicing both professions, $\frac{1}{3}$ giving their entire time to medicine, and the rest were sticking to pharmacy. The 4 per cent. pharmacists not graduates who were addressed by mistake, but whose letters were filled with

> "Good sense, which only is the gift of Heaven,
> And though no science fairly worth the seven,"

were sticking closely to their profession, but regretted lack of opportunity to graduate, especially in medicine.

It thus appears that of those whose educational advantages were such as to enable them to choose between the professions, 44 per cent. chose medicine, 19 per cent. combined medicine and pharmacy, 13 per cent. chemistry, 13 per cent. pharmacy, 6 per cent. medicine and chemistry, and 5 per cent. manufacturing pharmacists and chemists.

Now of the 44 per cent. who seem to furnish the ground for asking this question, how many can really be considered as forsaking pharmacy? We cannot consider a man a deserter who serves in Company D with the intention of learning the manual of arms, the science of preparing ammunition, and the art of loading the guns preparatory to entering Company M; for they are both fighting the same enemies, pain, disease, and death. Company M, from their position, have a clearer view of the enemy, fire D's guns, and naturally get most of the glory: but deprive them of the munitions supplied by D, or let Company D make a mistake, and see how soon the enemy captures the breastworks.

Twenty-five per cent. of the 44 entered pharmacy to lay the foundations for a thorough course in medicine, leaving us only 19 per cent. who, after enlisting for life in D, entered M at their first opportunity. This is not an unusual percentage of desertions, considering how prone human nature is to change, and that

> "Man never is, but always to be blest."

I think investigation of other professions will show a greater proportion of changes. Theology drafts more largely on law, and law in turn on pedagogy, than does medicine on pharmacy. Medicine, so the statistics I have gathered show, contributes 13 per cent. of the pharmacists, so that really medicine's net gain on pharmacy is only 6 per cent. If we consider the number of doctors who have registered in Georgia as druggists since 1887 as indicating the number who have forsaken medicine for pharmacy, the ranks of medicine have suffered more from deserters than pharmacy. The Secretary's books show that of the 368 who have registered in the last five years, 196, or over 53 per cent., have been as M. D.'s. "Aye, there's the rub that makes calamity" for the pharmacist, for too often this pseudo-

disciple of Hippocrates, with but little knowledge of medicine, less of chemistry, and none of pharmacy, can in a number of our States practice both professions upon the presentation of his diploma and payment of the registration fee. 'Tis useless to comment on his influence on both professions, especially in prohibition towns. Now if only 44 per cent. of those educated both in pharmacy and medicine practice the latter, why is it that only 13 per cent. cling to the former?

I will read a few extracts from some of the letters I received, not mentioning names, though, unlike Commissioner Peck, I have preserved the original documents. Some present will recognize the quotations.

"I studied pharmacy as a preliminary step to medicine, because I felt it would be a benefit to me, and would also secure me a safe living. I do not practice pharmacy, but medicine, and devote the rest of my time to teaching and writing."—W.

"I began my pharmaceutical course with the ultimate object of studying medicine. Thought I saw a wider field for ambition in medicine than pharmacy, with fewer hours for labor and greater remuneration. The apparent higher social status of the physician had some weight in determining my course. Lastly, I saw so many men with weak minds, and these but poorly cultivated, who posed before an innocent public as wise men and efficient practitioners, making good livings, that I thought I could earn the means for existence in that profession. I practice only medicine."—F.

Now here is a deserter:

"I went into the practice of medicine as the only means of escape from the irksomeness of the drug business, and as being a profession that offers greater hope of ultimate reward, both professionally and financially. My knowledge of pharmacy has been a great assistance to me, and I think a two years' experience in pharmacy should be required of every medical student."—D.

"I studied medicine after graduating in pharmacy because I liked medicine better, both to study and practice, though probably my primary reason for quitting pharmacy was on account of the close confinement. I consider my M. D. degree an advantage as a pharmacist."—I.

"I studied medicine in order to make my business more remunerative. Cutting prices has taken the profit out of drugs—will abandon them if my practice proves profitable."—B.

Quotations might be multiplied, but these are enough to show the principal causes that impel the pharmacist to enter medicine. I will next quote from those who attempt to practice both professions.

"I was apprenticed in the '60's,' and my employer, in order to give me better advantages to learn chemistry and materia medica, sent me to attend lectures on these subjects in the medical department of the University of Louisville. I then made up my mind to become a doctor of med-

icine, but did not have the opportunity until 1878, when I graduated with first honor. I practice both professions, but my M. D. degree is no advantage to me as a pharmacist. In a large city like ours, the practice of both professions is detrimental to each. Why then, you ask, do I continue pharmacy? Because I have been unable to dispose of my pharmacy at a reasonable figure, and I can't afford to give it away."—B.

"In my judgment, the true cause lies in that inherent love of liberty and freedom from restraint that is born in the soul of every American boy. Having formed a taste for such studies, he feels that 'there is room at the top,' and that medicine will be a means to his gaining that goal. I am now practicing both professions, though I intend to confine myself more closely to my pharmaceutical studies. I believe my M. D. degree is quite an acquisition in my practice of pharmacy."—H.

The following is from a Nestor:

"I was a physician before the war between the States, and was a surgeon in the army, assigned to hospital duty. After the war closed drugs were hard to get, for love or money, and old soldiers had slim supply of either. I moved to my county town to practice and sell drugs. I have found my knowledge of disease and treatment a valuable help in the drug business. I do not think that my connection with the drug business has helped my practice, and don't believe any man should apply himself to both: either is extensive enough to absorb his entire time, energy, and talents."—D.

Now we will have a few ideas from those who entered chemistry:

"I studied medicine because I considered it an advantage to me whether I practiced pharmacy, medicine or chemistry. Being State chemist I am intimately connected with each. The public generally regard the physician as more of a professional man and more learned than the pharmacist. The dear people, as a rule, think their doctor really knows more of pharmacy than the pharmacist himself. The physician deserves the dignity his calling gives, and usually labors hard to sustain it, while the pharmacists seem striving hard to pull down their business from all professional standing; chief among these are the cutters. This often drives ambitious, intelligent pharmacists into the medical profession."—P.

"I studied medicine to know more of medical jurisprudence. Do not practice either medicine or pharmacy, but am an analytical chemist and teach chemistry and pharmacy."—M.

Those who have returned to pharmacy are next quoted:

"I clerked in a drug store nearly four years before entering upon the study of medicine, and after graduating I practiced three years, two of which were spent in the army. I concluded I preferred pharmacy, and embarked in it in 1867. I do not practice medicine, because I do not think the two can be entered into successfully at the same time, except on a small scale. I believe the M. D. degree is an advantage to the druggist,

because the general ignorance of the public, as a rule, accords the physician too much ability and the pharmacist too little."—H.

"I studied medicine because I found it much easier to obtain an M. D. degree than educate the general public to the fact that a man can be a thorough chemist without being a doctor. Yes, I practice both professions, *i. e.*, I have an office and laboratory in a pharmacy. I do strictly an office practice, giving special attention to life insurance examinations, look after pharmaceutical preparations, and devote the rest of my time to teaching chemistry and analytical work. I find my M. D. degree an advantage as a chemist; besides there is no denying the fact that it does often add to your professional and social standing."—S.

"I made up my mind to study medicine before I left school, and entered a drug store and college of pharmacy simply as a preliminary study. My father dying, I had to make some money before I could continue my medical studies, and I remained a pharmacist longer than I at first intended. After graduating in medicine I sold my drug store, and have not since been interested in the retail business. I found my knowledge of pharmacy of such great value in my practice that I have ever since recommended to young men first to study pharmacy before going to the medical schools. In the Missouri Medical College, for several years past, the gold-medal men have been graduates in pharmacy. I am now, and have been for the past ten years, a manufacturing pharmacist, and as such I find the knowledge of both branches of excellent service."—W.

"I am not an M. D., as you supposed, but a pharmacist, with forty years' experience, and with that experience I am enabled to understand what an immense advantage it is to have the theory and practice of medicine at one's command—an advantage both in the business and social world. It would aid greatly towards bringing the physician and pharmacist together, and in no other way can this desirable result be obtained. I therefore strongly recommend the rising generation of pharmacists to take the study of medicine early into consideration as a most important part of their preparation for the independent practice of pharmacy. First, by increasing the knowledge of the pharmacist, and thus raising the standard, and second, in order to secure the respect and consideration which this profession has not yet been accorded."—I.

The other old pharmacists agree with this in the main, but notice how a doctor of pharmacy joins issue with them:

"The reason I studied medicine was by the advice of relatives overruling my better judgment. I never at any time combined the two. The M. D. degree cost me my good name as a druggist, and ruined my business; it was the death-knell to my success, and it has taken twenty years to recover from it socially. The doctors, I suppose, thought me a poor druggist, and the druggists thought me a poor doctor. This is my personal experience. My own medical brothers have 'robbed me of my

good name, and made me poor indeed,' and not enriched themselves. My pharmaceutical brothers, after twenty-three years, have heaped many offices and confidences upon me."—W.

These statistics and quotations show us that there is not as large a proportion of pharmacists who desert their profession for the practice of medicine as is generally supposed. The chief cause that impels this change is ambition. "By that sin fell the angels," and how can we expect more of the poor pharmacists?

Some are driven from their arduous toils by the cutter, who is worse professionally than the quack; for the latter is a vampire, sucking blood from other animals, but the former, like the cannibal, destroys his own species.

The opinion of those who attempt to practice both professions is that, except in country towns, the combination is a failure. All, I believe, are agreed that as a preliminary study pharmacy is a great aid to medicine, and I am glad to see that many of our medical colleges now requiring three or four years to complete their course recognize the pharmaceutical degree as equivalent to one course. The physician's fees and the physician's social position tempt the pharmacist from the prescription counter to the bedside and hospital. Others find in studying pharmacy that chemistry is more compatible with their tastes, and enter that charming field of science as teachers and analysts; while yet others, appreciating the beauties of synthetical work, enter the manufacturing departments with good hopes for greater financial returns.

The practical benefit, as shown above, of the M. D. degree to the pharmacist, depends entirely upon circumstances. If he is located in a city it is a disadvantage; if in a town he reaps a substantial reward for the time he devotes to medicine. The regrets of the old pharmacists are that they had no opportunity to graduate, especially in medicine, while the doctor of pharmacy thinks graduating in medicine almost ruined him.

I think the star of hope for the elevation of both professions shines brighter to-day than it has in half a century, notwithstanding the threatening storm of tablets, triturates, physicians' prescriptions, etc., poured upon us by the manufacturers and nostrum makers, falsely styling themselves chemical companies.

The lengthening of the medical course to four years, and the example of such institutions as the Johns Hopkins, University of Pennsylvania, Harvard and others, in requiring a knowledge of chemistry and pharmacology of their graduates in medicine, will have a beneficial effect. We believe their example will be followed by others, and that their doctors will know how they wish their own chlorides, bromides, etc., combined, not attributing miraculous cures to well known therapeutic agents simply because prepared by some particular chemical company that has distributed samples and freely advertised in the medical journals. Then the

pharmacist will not have to do counter prescribing in order to eke out an existence, for the physician will no longer prescribe nostrums and fraternal relations will be thoroughly established.

To hasten this good time let "each of us walk a highway of his own, and keep the company of his self-respect, and turn not from it to make a friend or shun a foe."

MR. REMINGTON: We have at our meeting to-day, a gentleman who has had a vast amount of experience in the questions which we are discussing, and particularly in the matter of examinations and pharmaceutical education. I regret to say that we are not likely to have him with us long. I don't mean to say that we are going to lose him, or that he is going to be now translated with the saints, but that he will not remain much longer in the city of Chicago, and probably not long in this meeting. I would, therefore, ask that he be invited to say a few words to us about pharmaceutical education in Great Britain, and the difficulties which have been met with there. I believe we shall probably get a great deal of valuable information from Mr. Carteighe, of the Pharmaceutical Society of Great Britain.

MR. CARTEIGHE: In England, we are in the habit of calling this mode of selecting a speaker, "Trotting out your horses." I must apologize for being thrown into your midst in this way, but shall be very pleased to express my views on the subjects in which this Section may be presumed to be specially interested. What I shall have principally to say will be to point out what has been our experience in Great Britain, and what we are looking forward to in the future.

Now, from what I have observed regarding pharmaceutical education and legislation in the United States, it seems to me that you, in this country, are suffering from this serious condition, that you have an enormous number of examining boards, and necessarily you must have them, your territorial area being so extensive, and the trade regulations with respect to the curriculum and the value of the examinations before boards of pharmacy must be very different in the various States. One may also conceive that in many States an imposed curriculum could not, for some time to come, be enforced. That, I think, is the case here, and I foresee that when the education of the medical man and the education of the pharmacist in every State of the Union shall be conducted on a satisfactory basis, the future both for medicine and pharmacy will be improved in the United States.

The combination of medicine and pharmacy, referred to in the paper read by Mr. Slack, is one upon which we have learned to look with the utmost distrust in Great Britain. It is true that a pharmacist may become—and often does become—an able medical man, but I am quite certain that in Great Britain (and I have no doubt it is the same in this country) an educated pharmacist can make a good living if he is properly educated, without raising the question of medicine; and the combination of the two professions is, I think, a disadvantage. We are trying, as much as possible, to separate the practice of pharmacy from the work of the physician. As an example of the injury wrought by the combination of the two professions, I may mention that all over the manufacturing districts of Great Britain there are men who are called "apothecaries," but who do not correspond to apothecaries in this country. Such apothecaries are usually pharmacists, but unlike the "apotheke" of Germany or elsewhere, they are really medical practitioners, who stand behind their counters and prescribe in the morning, dispense the medicines for their patients, and then go out in the afternoon and evening—and indeed they may be always out, and may leave the dispensing and the serious part of their work to other and less competent hands. I say "other and less competent hands," because it is a difficulty with us that the "apothecary" has certain privileges as a registered practitioner,

and is allowed to dispense medicines for his patients by means of, or through, unqualified persons. For instance, if he keeps an open shop, as an ordinary druggist does here, the person who dispenses poisons is bound to be registered under the law, but the doctor is allowed to poison his own patients through the agency of his servant if he thinks proper to do so. Now, that is an evil, of course, of considerable magnitude, and there is no question that apart from other pecuniary interests which we as pharmacists have in our own practice, it is distinctly better for the public that the practice of pharmacy should be vested in one set of men, and the practice of medicine in another.

With regard to education, we still retain, or our legislature does, such a strong disposition to trust free trade in the matter of education that we have not made as much progress as we should wish. A great deal of stress is still laid upon the value of examinations, and I have no doubt that there are a number of members present who also believe in the eternal virtue of examination. Well, sir, I must say frankly that I do not believe in it at all, as the sole test of qualification. I believe that the general forms of examination, the papers set, and the work done in many examining institutions, both here and in Great Britain, are of little practical value. I include now the Pharmaceutical Society itself, because we are, to some extent, a State body, and conduct, by our boards of examiners of London and Edinburgh, State examinations under the control and supervision of the Privy Council. I have been an examiner and a teacher for something like twenty-seven years in various forms, both officially and unofficially; and the older I grow, the more satisfied do I become that it is exceedingly difficult to assess the value of a man's qualifications by a mere examination. I feel certain that we in England are rejecting competent men, time after time, and I am equally certain that we are passing men who are glib and well crammed but who are incompetent. I say that as a matter of perception, but as one cannot give a vote against a person examined, or pluck him, by reason of perception alone, we are bound to take things as we find them.

For the past few years, we have tried to get the chemists and druggists throughout the land to agree to an enforced curriculum, for, as you know, unless a curriculum is enforced, it will not be carried out, and we have, therefore, from time to time, endeavored to get the whole of the pharmaceutical body to agree to a compulsory curriculum. I believe that we now have the great majority of the educated chemists and druggists with us in favor of this plan. On the other hand, we have a certain number of men who raise this question: "Why should you insist upon any training at all? Are you examiners so incompetent that you cannot sit down and examine a man?" and those two classes of men exist in the United States, I have no doubt, as they do with us.

It is impossible for an uneducated man to understand what we mean by "training." Now, what should that training be? Speaking for my own body, I want the training of the store and the training in elementary science, the whole thing put before me as an examiner, and I want to examine a man upon his merits. Instead of running over the whole gamut of organic chemistry, for instance, I prefer to set him to work upon one portion of the subject in the ordinary curriculum, examine him upon it, and judge of his work not only by the way that he answers questions or by the way he carries out practical operations, but by the amount of work he has done before and the way he has done it.

You will perhaps be surprised when I tell you that even in Great Britain, at the present moment, we are not absolutely sure that our applicants for registration have had three years practical experience in pharmacy. Our law provides that an applicant for registration shall produce evidence of having been for three years engaged in the reading and dispensing of prescriptions. The language unfortunately is so wide that it has come to this, to put it plainly, that the certificate is of no value, and we find ourselves now and then confronted by a man who has extremely good elementary scientific knowledge, but who has absolutely no knowledge of practical pharmacy whatever.

The effect of examination by our system, without a curriculum, has been to throw into pharmacy men of fair ability, but who have very little practical knowledge of their business: and to that extent it seems to me that the State is defrauded, the public is not getting what is wanted, and that it is absolutely wrong for any member of a profession like pharmacy to say that it is not necessary for a young man to have had a previous training before examination.

In regard to the ordinary examinations in Great Britain for certain positions, the certificates of the teachers with respect to the work done by applicants for examination, and the positions they have occupied in examinations held monthly, for instance, are taken into account. I may add that I belong to an institute called the Institute of Chemistry of Great Britain and Ireland, which seeks to make men competent chemists as distinguished from pharmacists. I don't mean for a moment to assert that a competent pharmacist is not a competent chemist, but to say that there is a great deal of professional work to be done everywhere, here and elsewhere, in which a thorough knowledge of mathematics, physics and other subjects is required, in fact, knowledge of a more advanced character than is generally possessed by the average pharmacist. For this reason I advocate and have always advocated a good, sound and even a high standard of education on the part of the registered pharmacist, and especially on the ground of public safety. At the same time, I am opposed to pushing scientific education so far as to make it an absolute burden to enter the craft at all. Consequently, I prefer, from my standpoint, that a candidate should have been trained in the store for at least three years (better if four), and that he should be compelled to pass his preliminary examination before entering that store. Unfortunately we have not the power to impose that requirement. We have a preliminary examination, but the candidate may pass it at eighteen or nineteen or before he presents himself for the first part of his college examination, with the result, of course, that the clerk or apprentice goes on during the period of his apprenticeship acquiring the necessary educational knowledge by a process of cram, at a time when he ought to be acquiring some of the technical knowledge for his qualifying examination. We are thus beset with the difficulty in regard to the subjects of chemistry and botany, that many men do not thoroughly understand what they are cramming, in many respects, and do not understand the meaning of terms. Avogadro's law, for instance, would furnish me with illustrations of this want of knowledge of terms. And how can we expect men to understand or to be able to appreciate that great law, or even appreciate the experiments that Professor Simon has shown should be made on the kindergarten principle, to illustrate the law of volumes? What is the use of this to them, if they do not know the meaning of terms? There are many candidates with us, I am quite sure, who take their examinations, who are said to have passed thoroughly, but yet who do not understand the difference between weight and volume, and that is part of the generally deficient education in some portions of our country.

We also suffer from this great evil, that while we are endeavoring to raise the standard of pharmacy to a higher point on the one hand, it is open to a broken-down medical man on the other to carry on the business of a pharmacist; and in certain towns where the whole of the dispensing of physicians' prescriptions is small, what there is, is very often done in the shape of dispensing by the apothecary for his own patients. That sort of apothecary or general practitioner is not common in this country. Here, I believe, the druggist who is also practicing as a physician generally keeps a store; but where, as with us, there is often no local store, there may be in a small town half a dozen registered practitioners who go to see their patients and return to their surgeries (as I stated in my opening remarks) to dispense their own remedies, or else entrust that part of the business to incompetent persons. Some of us have often felt that it is a great advantage that a medical man can certify to death and a pharmacist can not. I hold, further, that for the safety of the public, considering the potency of the remedies which are being

more and more employed in the practice of medicine, it is eminently a safeguard to the patient that the prescriptions for toxic agents should be written by *one* competent man and dispensed by *another* competent man for the patient to take.

As I said before, we are as you are here, gentlemen, engaaged in partly a trade and partly a profession, and when some people set up the cry, "What is the good of education?" my answer is, that you will not be able to make a living at all in another twenty years unless you march with the times. Education is certainly progressing with us, although you are very much better off in that respect than we are, in most of your States. But education is at last moving in Great Britain, with enormous strides; and if a pharmacist knows no more of the elementary sciences on which his art is based than the customer who enters his store to have a prescription filled, he will very soon go to the wall. It is not a question of whether education is good for anything or not, but the question of questions for us in Great Britain is this, that the pharmaceutical curriculum, keeping pace with the advancemeut in the curriculum of the medical profession, must progress further and further, in order that pharmacists may make a living; and such progress we find in all the larger towns and cities, where the educated part of the community are beginning to respect the pharmacists as much as the medical men. Therefore, the old doctrine that a pharmacist because he kept a store was not to be respected, is rapidly disappearing; and, in my own judgment, the amount of respect that any pharmacist receives from the public is exactly that which he can create for himself if he understands his craft —if he is honorable, and carries on his trade with refined professional feeling, with a due regard to his conscience, as well as to his dollars; and such a pharmacist will be respected as much as the medical man. [Applause.]

The Chairman: In connection with the remarks made by the President of the Pharmaceutical Society of Great Britain, I would like to introduce, by title, a communication from the Secretary of the Pharmaceutical Society, "Answers to Queries of the American Pharmaceutical Association," in which substantially the same subjects as those treated by Mr. Carteighe have been embodied. I would like to read it by title. I also desire to read by title a communication from Prof. Edward Shär of the University of Strassburg, Germany, showing the condition of matters in Germany. These communications will be published in the Proceedings.

CIRCULAR LETTER OF QUERIES.

191 Dean Street, Brooklyn, N. Y., U. S. A., *May 29, 1893.*

The Section on Legislation and Education of the American Pharmaceutical Association desires to be able, at the coming meeting at Chicago in August, to present reports from various parts of the world of what is being done for pharmacy within this special field. With this object in view, we beg you to favor us with a sketch of the state of such affairs in your country, or in the event of your not being in a condition to do so yourself, that you will interest another in the matter, who will do so. We wish to know what qualifications your country requires of pharmacists, the restrictions imposed in the sale of poisons, the obstacles in the way of executing pharmacy laws, proposed alterations in such laws, whether you view such laws as beneficial or injurious to the interests of the pharmacist; your restrictions on the sale of proprietary medicines, the number of schools and colleges of pharmacy you have, the time of study and qualifications required for graduation, the degrees conferred, the subjects taught, the time of study devoted during a term to each subject, the reforms being advocated, the number of pharmaceutical societies, the objects for which they are organized, the per cent. of pharmacists belonging to such societies, etc.

If you will also frankly state your impressions of the subjects on the other side of this

sheet, you will thereby enable us to gain a glimpse of the difference between your way of looking at such matters and our own.

Thanking you in advance for the trouble you take in our behalf, I am in behalf of the Committee

Yours very respectfully, R. G. Eccles.

ANSWERS BY THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

LEGISLATION AND BOARDS OF PHARMACY.

The view taken in Great Britain is that the safety of the public can be most efficiently guaranteed and the educational fitness of the pharmacist insured by pharmaceutical legislation.

A pharmacist is responsible for injuries caused by the error or negligence of his employés.

It is regarded as absolutely essential, in the interest of the public, that assistants charged with the sale of potent drugs should be registered, as well as the proprietors and managers of drug establishments.

The Pharmaceutical Society of Great Britain encourages students to pass an examination in general education before entering upon apprenticeship, so that they may during apprenticeship devote their time to technical training.

We do not nnderstand how graduated pharmacists can be registered until they have passed their examination.

Our opinion is that, although it may not be essential to restrict the sale of all proprietary preparations to pharmacists, the sale of potent or poisonous proprietary preparations by unregistered persons should be strictly forbidden by law.

We do not see that any useful purpose would be served by having patent-medicine makers print upon each package the formula of its contents.

It is greatly to be desired that such a curriculum should be required, viz., for every college a minimum time of study of three years, with six to eight college months to the year, before granting a degree.

The qualifying examination in Great Britain is not a written one, but consists of practical work and a *viva voce* examination.

There appears to be no objection to the publication of past examination questions with us.

The educational arrangements in force in this Society's School of Pharmacy may be learned from the prospectus accompanying these answers.

ANSWERS BY PROF. EDWARD SCHÄR, STRASSBURG.

To Robert G. Eccles, M. D., Esq., Chairman of the Section on Legislation and Education, American Pharmaceutical Association, Chicago—

Dear Sir: In a former correspondence you had expressed the wish that I might send you a paper in answer to the queries for the meeting of the American Pharmaceutical Association to be held in Chicago. Of course I should have liked to have answered your request in a more thorough manner by sending to you an elaborate paper on some subjects concerned in the said list of queries. If I am not able to do so, it is because of my being still rather hardly engaged in the last labors of preparation for the publication of the new Swiss Pharmacopœia; still remaining for a few months in the old position I held at Zurich as President of the Commission for the Pharmacopœia.

Being anxious not to behave altogether in the negative way to your Association, of which I am an honorary member, I beg leave to be permitted to send to the Association for the meeting at Chicago a few observations concerning the queries 7 to 11, so that instead of a formal paper you may at least, in the form of this letter, get the opinion of one of the European members of the profession. In order to spare the time for translation

from German into English, I take the liberty of writing down my ideas in the latter language, of course not without imploring your indulgence for the many proofs of incorrectness in style and grammar.

To begin with No. 7 of the Queries: Should any candidate be permitted to graduate in Pharmacy before he is able to apply the tests and assays of the United States Pharmacopœia? Very nearly related to query 7 is query 11, which I beg leave to quote at the same time: Should candidates for graduation in Pharmacy not be able to make all preparations, a process for which is given in the U. S. Pharmacopœia? Answering first to query 7, I would not hesitate to declare that the demand contained in this query ought to be considered as a "*conditio sine qua non*" for graduation in Pharmacy, and this is not only in regard to the United States of America, and to the U. S. Pharmacopœia, but for all countries of the world, and for all Pharmacopœias in general. Indeed, I cannot see how it would be proper to bestow the right of keeping a Pharmacy and dispensing medicines on any one, who is not thoroughly acquainted with the means of examining the genuineness and purity of the drugs and chemicals used in Medicine and Pharmacy, and who is not able to apply with some accuracy and security the assays which are given in the Pharmacopœia of his country. The knowledge of the form and nature of the impurities and sophistications of medicinal drugs and chemicals, as well in the natural as in the prepared conditions, seems to me to be the very first requisite of any scientifically trained pharmacist in our time, in which the majority of chemical preparations. and of powdered or otherwise prepared drugs, no longer belong in the domain of the pharmacist himself, but to large and small commercial and manufacturing establishments.

This opinion leads me to an observation of a more general character. that is to say to the utterance of my firm conviction, that the Pharmacopœia, or better, the Pharmacopœias, ought to be acknowledged, used and treated, in a much higher degree than hitherto, as a chief source of information (for the practical pharmacist and also for the physician), in matters of practical pharmaceutical science, and especially of pharmaceutical chemistry, and pharmacognosy (Materia Medica). I would also go a little further, and say that even in regard to pharmaceutical examinations, the Pharmacopœias should play a much more important part, and that the regulations concerning state examinations of pharmacists, and of medical men too, ought to depend on the thorough and intimate acquaintance with the contents of the Pharmacopœia, and have a rather larger influence on the judgment of the scientific (I say intentionally the scientific) and the practical capacity and attainment of the candidate.

Indeed, if I am allowed to speak on this matter, by reason of a pretty long experience in Pharmacopœia matters in Switzerland, my native country, I might feel bound to ask the question conscientiously of the whole pharmaceutical, and in a rather higher degree also of the medical profession (at least in Europe), in what relation does the use, the knowledge, the approbation, and estimation of Pharmacopœias stand to the comparatively great, not to say immense measure of professional labor, science and experience laid down in our more recent Pharmacopœias, as for instance in those of the United States. France, Germany, Great Britain, the Netherlands, Italy and others.

The composition and elaboration of new Pharmacopœias, and even the periodic revision of former editions, involves such a great deal of studying, sifting, critical examination and practical control of Pharmaceutical and other related literature concerning the origin and quality of drugs, the rational methods of preparing important galenical preparations, as extracts, tinctures, etc., and last, not least, the identification and assay of official chemicals, that it can be asserted without hesitation, that in the newer and most renowned Pharmacopœias of our day we have the real "quinta essentia" of pharmaceutical knowledge, as well in the scientific as in the practical direction. So we may quite well, without the slightest intention to undervalue, or even to depreciate the importance and necessity of a solid instruction in general and theoretical chemistry, botany and

physical science, put forth the assertion that in pharmaceutical examinations the degree of acquaintance with the contents and methods of the Pharmacopœia can be used as a kind of "experimentum crucis," in the judgment of the professional education and the personal capacities and attainments of the future pharmacists. On this occasion I may add the incidental confession, that in my former position at Zurich I was known among pharmaceutical pupils of the Federal polytechnic school, for saying that no candidate for pharmaceutical graduation would ever be refused who could prove himself in full practical possession of the knowledge of the Pharmacopœia; of course not in the sense that the memory of candidates should get overburdened with the numerous formulas of compound and galenical pharmaceutical preparations, but to the effect that the student desirous of graduation ought to be familiar with all the chief Pharmacopœia methods for identifying and assaying drugs and chemicals, and also with the chief characters of the substances as described in the Pharmacopœia.

Taking this point of view in the matter of Q. 7, I need scarcely affirm that in matters of Q. 11 (quoted above) I stand in thorough and reserveless accordance with the idea there announced, thinking that even in a period in which the preparation of almost all official chemicals, and of a pretty large percentage of galenical preparations and compound medicines, has been transferred from the laboratory of the pharmacist to that of the manufacturing chemist, the former should be acquainted with the *modus præparandi* of the most important official chemical preparations, and able to make those for which a process is given in the Pharmacopœia.

It is well known, of course, that modern Pharmacopœias for the most part have been led by the course of things to omit the describing of processes for almost all chemical preparations, which can be obtained in commerce in uniform quality and composition, making exception only for chemicals, the composition and action of which depends upon the process of preparation. Still, it must be acknowledged, that a few of the most recent Pharmacopœias (among which we may cite the new Swiss Pharmacopœia just ready for publication) have adopted the principle of giving a choice series of processes convenient for the laboratory apparatus which may be expected and found with a pharmaceutical chemist of our day. This has been done from a pedagogic point of view, in order that younger pharmacists might not altogether miss every occasion, and lose every experience in preparing official preparations of a chemical nature; for it may well be asserted that a pharmacist who has never had any chance of practice in the preparation of chemical drugs will never be able to judge in a logical and rational manner, the origin, nature and amount of impurities in chemical substances, used in medicine, and will depend entirely on the text books of pharmaceutical and chemical literature.

It would be, therefore, most desirable that the newer and future Pharmacopœias could introduce a number of duly and conscientiously selected processes well adapted for use in the examinations, that is to say not too difficult, but still of such kind that they may secure in the candidates the necessary degree of dexterity in chemical laboratory work.

Query 8: What should be the minimum limit of knowledge in microscopy before being permitted to graduate?

The highly important and indispensable character of microscopic study and exercise in regard to a scientific and successful exertion of the pharmaceutical profession is so universally acknowledged in our time, that every discussion on the principle itself would be needless in this place, and before a society of graduated and practising pharmacists. The only question indeed can and must be that of the Query 8, which, besides some general observations to follow, will better be answered in connection with the two queries No. 9 and 10.

It will suffice, then, to state two facts in a more general answer to Query 8; first, that a more or less intimate acquaintance with the microscope and its use, as well as with the microscopic characters of chemical, vegetable and animal substances, is indispensable,

not only for a clear notion and successful perception of the numerous facts and theories in general and physiological botany, which must forever remain the only sound foundation of pharmaceutical botany and pharmacognosy (Materia Medica), but also and in a still higher degree for the practical applications of the last named discipline (pharmacognosy) which in these days has often, and according to my opinion quite rightly, been proclaimed as the chief and leading part of pharmaceutical studies, especially in that admirable combination with chemistry, history and geography to be found in that classical "Pharmacographia of Fluckiger and Hanbury."

And secondly, that the microscopic training of the studying pharmacist is of foremost importance, to the effect that a pharmacist who is equally acquainted with chemistry, and with microscopic botany and materia medica, must be considered as the most competent and most reliable, and in numberless cases the only available expert in matters of hygiene, of food adulteration, of toxicology, and even of commercial questions, etc., so that he will be selected to such positions in preference to other persons, as well by government authorities as by commercial boards and other associations. This, indeed, is the case in many European states, as for instance in Switzerland, Italy, Austria. It is much to be regretted therefore that in numerous countries, and above all in the German empire, microscopy has not played till now any direct part in the pharmaceutical examinations, at least inasmuch as practical microscopy is concerned. Any larger want of the demand of a certain degree of ability in microscopic working would, of course, at length lead to a scientific degradation of our profession in the eyes of other learned men who have passed through academic studies.

Query 9: What should be the minimum limit of knowledge in botany before granting a degree?

As for this question there seems to exist some diversity of opinion among the pharmacists and pharmaceutical authorities of the different countries of Europe, a diversity which, besides, can easily be traced to the regulations for pharmaceutical examinations in the different States. Either the general botany is placed in the background and but accidentally touched in the botanical part of the oral examination, which consists mainly in the answering questions of systematic and pharmaceutical botany, or, on the contrary, these latter disciplines are restricted to a few questions in connection with materia medica, whereas the whole oral examination in botany is devoted to the biology of plants, the propagation of phanerogamic and cryptogamic plants, to the structure of cells, plant nutrition, and other matters of physiological botany. In somewhat rarer cases, as for instance in Germany, two distinct botanical examinations take place, the one of which is rather a practical one, consisting in the discerning of a number of plants, partially medicinal, together with the explanation of questions of systematic botany and of details of medical botany, while the oral examination in botany deals only with the more important facts of the physiology, anatomy and morphology of plants. It need scarcely be said, that a system of botanical examinations which respect both the general and the systematic and medical botany in a relation adapted to the real wants of the profession, would be the really golden middle-way. In fact there can be no doubt that well digested notions of general botany will add to the general scientific qualification of the pharmacist, who, in the same degree and from the same point of view as the physician, ought to be a naturalist. But there exists a still more urgent motive for a satisfactory acquaintance of pharmaceutical students with the chief parts of general botany, viz., that beyond doubt general botany is indispensable for a thorough introduction into special and medical botany, as well as into the microscopic domains of pharmacognosy in its more recent scope, including even for the pharmacists a pretty large part of technical botany. We may then, to answer the question about the minimum limit of botanical knowledge, express the opinion that a candidate for graduation ought to possess first clear notion concerning the capital facts of vegetable biology; second, a thorough acquaintance at least

with those parts of vegetable morphology and anatomy which are needed for making free use of the methods of pharmacognosy; third, sufficient notions of the more important botanical systems for classification of plants, including of course the Linnean system; and also of the characters of those plant families which are of theoretical or practical interest; fourth, convenient knowledge for identifying the more important plants of official, technical and economic use, together with sound notions concerning their sophistications.

Query 10: How much knowledge of materia medica should be required of every graduate in pharmacy?

Adopting a synonymous meaning of the two terms materia medica and pharmacognosy, it may be first stated, that this discipline, notwithstanding its general introduction into the pharmaceutical examinations in our European states, plays a pretty different part in the examinations of different countries. So, for instance, in the German examinations, we have a single rather practical application of materia medica or pharmacognosy, consisting in the recognition of a number of at least ten official vegetable or animal drugs, with the necessary remarks concerning their origin, use and sophistications, but without farther notions on their anatomic and microscopic characters, their chemistry and history; whereas in Switzerland, pharmacognosy forms an important part of the oral examinations, which take place as the last stage of the whole examination. No special hints being given in the regulations, this examination in materia medica may be conducted, and really is conducted, from a wider point of view, and in a more exhaustive manner, but not without presenting to the candidates a series of different drugs, which ought to be identified and explained, in regard to their morphological characters, their commercial ways of exportation and importation, their chemical qualities, and so on.
It must be granted, however, that after this system, much will depend on the personal opinions and the scientific and professional quality and training of the examiner, inasmuch as there is a want of precise rules. To face such discrepancies in the value accorded to materia medica for graduation it is but logical and reasonable to ask Query 10: "How much knowledge of materia medica should be required of every graduate in pharmacy?"

The answer I have to present on this point cannot be doubtful to those who have heard some general ideas expressed in this paper respecting the scientific, education and position of the pharmacist in recent times. I would answer, first, in a more general sense, that Materia Medica, viz., Pharmacognosy, is that part of professional science in which the relatively highest demand ought to be maintained in examination, and this for the simple and translucent reason that Pharmacognosy is the most special domain of the pharmacist, the domain in which, when thoroughly initiated and trained, he will scarcely find his equal among persons belonging to any other scientific profession. I may even go so far as to say that modern Pharmacognosy (according to that well known school, which has issued the "Pharmacographia," as a national simultaneous application of different natural and philosophical sciences for the aim of a profounder knowledge of medicinal drugs), can be considered if not as the only, at least as the chief thing, which makes pharmacy a scientific discipline of his own and pharmacists members of an independent learned profession. And secondly, in a special direction, repeating my conviction that well composed modern Pharmacopœias ought to be the standard works, not only for imparting to the Pharmacist a stock of solid and useful knowledge, but also for judging by examination of his professional and scientific attainments. As a minimum limit of knowledge in Materia Medica, I would be sure to demand: First, thorough acquaintance with the botanical and geographical origin of all important drugs described in the Pharmacopœia, including important facts concerning their history; second, accurate notions about the chief external and morphological characters of drugs, including the most characteristic anatomical elements to be detected by the microscope, in special

regard to the identifying of the drugs in powdered and mixed state; third, sufficient notions concerning the active or otherwise important chemical bodies contained in the drugs, including important chemical reactions, to detect them, and to secure additionally the identity of drugs; fourth, and lastly, some familiarity with the different commercial varieties of drugs, their substitutions, and sophistications, and the mode of treating for galenic preparations.

In concluding these observations to the queries of your Association, I feel bound to confess that their deficiency is conspicuous to nobody more than to the author; in recommending this paper to the benevolent reception of your conference, I finally beg leave to present on this occasion of the Internaternal Pharmaceutical Congress at Chicago, my sincerest wishes for the prosperity of the American Pharmaceutical Association, and for the success of Pharmaceutical studies in the United States.

Believe me, gentlemen, to remain with high esteem,

Yours very truly,

EDWARD SCHÄR, M. D.

Professor of Pharmacy to the University at Strassburg,
Strassburg, Germany, July 25, 1893.

Mr. Sayre read the following paper:

SHOULD CANDIDATES FOR GRADUATION IN PHARMACY BE ABLE TO MAKE ALL PREPARATIONS, A PROCESS FOR WHICH IS GIVEN IN THE UNITED STATES PHARMACOPŒIA?

BY PROF. L. E. SAYRE.

In order to discuss this, it is necessary to define the qualifications of a candidate for the degree of graduate of pharmacy, at least so far as his knowledge and skill of and in the manufacturing of pharmaceutical and chemical preparations are concerned. In order to ascertain what his status should be in this direction, it is of course natural that we should look at it from the standpoint of the educator. I do not mean by this that we should take a one-sided view. The student who becomes a candidate for a degree, and the educator who has instructed him, are both responsible to the public, which expresses itself in no uncertain tones through the medium of legislative enactment, demanding that the compounding of medicines be restricted to qualified persons. The educator is keenly alive to this sentiment, and is less likely to take a narrow, one-sided view than the student or the pharmacist himself. What constitutes thorough knowledge in pharmacy is of course open to debate, but in the above question we do not have this to consider. We have to consider whether a practical knowledge of the Pharmacopœia or a certain prescribed amount of skill is essential to the student's proper education.

It may be surprising to many to learn that there are those in the craft who deny the necessity of what we understand as special training, and almost ignore the value of that skill in practical manipulation in the pharmaceutical laboratory which the average educator upholds as essential; but I regret to say there are not a few who, pursuing pharmacy "for the money there is in it," look askance at what is called science or skill in the profes-

sion. To illustrate this, I cannot do better, perhaps, than to transcribe the very words of a fair representative of this class as I find them in a pharmaceutical journal. They are as follows:

"The drug business is essentially mercantile. It is not confined to dispensing drugs on physicians' prescriptions. Success depends then on doing business on business principles. Druggists in these days are in danger of being too scientific. One of the most successful business men in New York, when interviewed lately with regard to making money, said that in his experience he had found that too much technical education was not profitable, and that, as a rule, college education did not qualify a man so well for making money as contact with the world. In Germany pharmacy has become so scientific that the Government has been obliged to grant subsidies to maintain it. * * * * * It impossible to carry on the drug business on ultra scientific principles, and make it pay. * * * * Now, if you want to make money in the drug business, you must sell what people want and keep up your business. It is a very nice thing for a man to be a Ph.G., and try to pass for a great man, but there is no money in it. A man may look as wise as an owl, but it won't pay his bills. What you want is to sell your goods to the people and get money for them. * * * * I think it is better for the druggist to be a merchant than a manufacturer. * * * * People will not pay a storekeeper much for professional knowledge."

"Pharmacists," such as the above sentiment indicates, would most likely take a decided negative position with regard to the question under discussion. They "can buy ready-made goods for less than the raw material costs," etc. If I were to assume that the position taken by such men be worthy of a moment's consideration, I might take time to discuss it; but with such men it is useless to argue, and to debate the question from their stand point would only be taking up valuable time of the body before whom this paper is read. He who follows pharmacy solely as a *business*, should not attempt to discuss what is essential to pharmacy as a *profession*. Nor should this opinion have any weight as to the qualifications of candidates for professional honors in pharmacy.

But there are pharmacists worthy of higher recognition who say that the details of the business are so great that they find little time for laboratory work, and as they can buy, at present, very advantageously, most of the pharmacopœial preparations, they do not see the necessity of making anything more than the simplest preparations, and those extemporaneous preparations which have to be made in the ordinary course of the trade—all of the so-called "practical skill" in pharmacy they are more than willing to hand over to the manufacturer. These are the men whom the manufacturer "delights to honor." If all pharmacists were like this man, what a clean sweep the manufacturers would have. The policy and destiny of pharmacy would be entirely in their hands! I do not say this to the dis-

paragement of the manufacturer. I do not believe that the fair-minded manufacturer wants to control the policy or the destiny of pharmacy; if he have the good of the profession at heart, he would rather "delight to honor" those who are able, and who stand ready to control, the policy, and shape the destiny of their profession. The fair-minded manufacturer is ready to aid, but not anxious to usurp the prerogative, the jurisdiction, the authority of the professional pharmacist. Students with the ideas of this pharmacist instilled into them are apt to regard the time spent upon the practical part of their course of study as time almost wasted; at least the question of the value of practical laboratory work is an open one to them, and they treat the laboratory training required accordingly. It is scarcely necessary for me to say what my views are regarding pharmacists who instil such ideas—men who wear a professional air and inculcate non-professional principles. The ethical spirit of such men may be professional, but it seems to me their position practically as pharmacists is inconsistent, if not wholly hypocritical.

For one to become a competent dispenser of medicines it is not enough merely to handle and read about the articles one dispenses. An intimate acquaintance with manufacturing processes such as come to one in actually making the preparations, is essential to proper and thorough training. One so trained becomes a critic—an authority, in a certain sense—as he should be, in judging, as a pharmacist, of the value of the preparations one dispenses.

A rather amusing example of the cost of ignorance came under my personal observation when in business in Philadelphia. A resident physician determined upon making some glycerite of tannic acid which he had been buying in half-gallon lots. He bought the tannic acid and glycerin, and mixed the two. To his surprise, they did not at once form a clear mixture. He became alarmed, and without waiting for counsel (or the critical inspection of other physicians of the hospital staff) he threw the whole (half gallon) away. I told him, if he had waited a few hours the whole liquid would have become as transparent as that which I had furnished. "Well," said he, "I had never made the preparation before, and when the thing did not turn out right I distrusted myself and the preparation."

Every one must admit that one cannot have too wide and intimate acquaintance with processes for making pharmaceutical and chemical preparations; but there are certain preparations which cannot be thoroughly known without making them for one's self. Where to draw the line for practical training it is difficult to say, but certainly one should at least be able to make all preparations a process for which is given in the United States Pharmacopœia.

It seems to me that the obligation of the instructor and of the student could not be cancelled with less work on the part of both. It is true that less instruction might be given and received; few would be the wiser; but I claim that he who presents himself for public patronage and recognition

as a pharmacist, must recognize the peculiar obligations (perhaps unwritten, but none the less binding) which the profession carries with it. And he who disregards these obligations is sinning against light of the most unmistakable clearness.

LAWRENCE, KANSAS.

The following paper was read by Mr. Whitney :

"WHAT ARE THE BENEFITS AND WHAT, IF ANY, ARE THE LOSSES TO THE COMMUNITY AND TO PHARMACISTS BY REASON OF THE EXISTENCE OF PHARMACY LAWS?"

BY H. M. WHITNEY.

In replying to this question, it is probable some facts or incidental evidence may be given bearing upon or relating to some one or more of the series of queries; but no attempt will be made to answer in full more than Query I, and as the writer has been on the Board of Registration in this State since the organization of the Board in 1885, the facts submitted will be confined to Massachusetts.

While Massachusetts is a progressive State, it is also a very conservative State; its legislature, elected annually by the people, are supposed to enact such laws as the people demand, and by the acts of the Legislature from year to year we have, it seems fair to assume, a basis for forming a correct opinion of the desires of the several communities of the State, as well as any class, located in every city, town or village in the State. Not until 1885 could the Legislature of Massachusetts be persuaded to enact a Pharmacy law, and up to the present time it has not been possible to secure any law regulating the practice of medicine; these two facts exhibit the cautious and conservative conditions which environ the law-makers of Massachusetts. The Pharmacy law of 1885 was so feeble that some of the leading pharmacists of the state advised the abandonment of the act. Others, more hopeful and not willing to relinquish anything they had secured, went to work on what there was. In May of 1887, the most objectionable section, permitting registration after three years of practical experience, was repealed. In 1889, upon request of the Board of Registration, an act was passed prohibiting the granting of a sixth-class license (druggist's license to sell liquors, fee $1.00,) to any person not a registered pharmacist in active business on his own account.

In 1891 five hundred dollars was granted the Board of Pharmacy to aid them in enforcing the Pharmacy law. In 1892 one thousand dollars more were granted. In 1893 two very important amendments were secured, and an annual appropriation of two thousand dollars was made. The law as originally passed and the amendments secured will be attached to this paper. *

* The amendments will be found in the Secretary's report. The original law was published in the Proceedings for 1885, p. 384.

These facts indicate, it seems to the writer, a decided and emphatic appreciation and approval of the work of the Board of Registration; and as it would have been impossible to have secured the amendments and appropriations without the aid and approval of well known and reputable pharmacists of the State, it certainly is fair to assume that pharmacists believe they are benefited.

To thoroughly understand and comprehend the conditions which environ the United States, and particularly the New England States, and fully appreciate the difficulties attending an effort for special acts of legislation and education, reference is made to the "American Commonwealth," by James Bryce, M. P., of Aberdeen.

One simple illustration of the free, independent spirit and unchecked liberty of act and speech, as seen by the writer in the campaign of 1840, was the placing upon a large canvass in front of a notion store these words:

> 'Free trade and ladies' rights,
> Perfect equality, and no monopoly,
> Two sticks of candy for ONE CENT."

Some opponent of a Pharmacy law may claim that the law of the "survival of the fittest," is the best and only remedy to apply in a free country. To such an objector the following questions and answers are submitted, taken from the records of those examined by the Pharmacy Board, and who, were it not for the Pharmacy Law, would to-day proclaim themselves chemists and pharmacists—with the suggestion that as the world moves to-day, in the strife for gain, the chances are that few of us or our grandchildren would ever see better pharmacists as a class than we have at present.

From the report of the Board of Pharmacy of Massachusetts to the Governor, October, 1886.

What is the dose of Paregoric? Ans. One and one-half teaspoonfuls.
How much Opium in a teaspoonful of Paregoric? Ans. Four grains.
What is the ordinary dose of Opium? Ans. Six to eight grains.
How many grains in an avoird. oz.? Ans. Don't know.
How many grains in a scruple? Ans. Don't know.

This applicant claimed to have had four years' experience in an adjoining state.

What is the active principle of Cinchona? Ans. Peruvian Bark.
Where does the Cinchona tree grow? Ans. In the United States.
Of what is Huxham's Tinct. of Bark, or Comp. Tinct. of Cinchona made? Ans. Hemlock.
What is the principal ingredient of the Spirits of Mindererus? Ans. Acetate of Potass. The applicant insisted upon the correctness of his answer.

After questioning about Cinchona, Quinine, Cinchonidia, etc., the following question was asked:

What is Quinine? Ans. I don't know exactly, but it's a metal of some kind.

What is decantation and trituration? Ans. Don't know; never heard the term before.

An applicant who claimed to be an experienced pharmacist was asked:

What would be the effect if a solution of Sulphate of Zinc was added to a solution of Acetate of Lead? Ans. A clear wine-colored solution.

Would there be no precipitate? Ans. No, none at all.

Out of ten samples of the commonest fluids found in a drug store, one only was identified.

Very common, crude drugs, such as Senna, Manna, Buchu, Mountain Cranberry, Aloes, Columbo, etc., were not recognized at all.

From report of October, 1889.

What is Blue Mass or Blue Pill? Ans. It is made of Aloes, Scammony and one other thing.

What is the source of Tartaric Acid? Ans. Citric Acid.

What is the source of Phosphorus? Ans. It is a metal.

This applicant claimed to have had over three years' experience. One claiming to have had six years' experience, repeatedly asserted that Blue Mass was Mercury rubbed up with Opium; and that Blue Ointment contained one per cent. of Mercury.

The proprietor of a drug store, who was desirous of securing a sixth-class license in his own name, came up May 17, for examination; aged twenty-six; two years' experience as proprietor of a store.

How many drops in a fluidrachm? Ans. Eight.

How many grains in an ounce? Ans. Two hundred and forty.

How much Cocaine would you use in making two drachms of a four per cent. solution? Ans. Four ounces.

Another, who was in the business on his own account, and claimed to have had twenty-three years' experience, when asked to interpret Na. Br., said, "That's a sticker; it may be Nebraska or New Brunswick."

From report of November, 1891.

What is the meaning of "Pro re nata?" Ans. Collect on delivery.

What is the source of Tartaric Acid? Ans. The hen's stomach.

What do you understand by the term dialysis, for example, dialyzed iron? Ans. Means the reducing a drug to liquid by electricity.

What is reduced iron? Ans. It is the reducing from a higher to a lower state.

What would take place if you mix tinct. cinchona comp. with tinct. chloride of iron? Ans. Cinchonine and Ferric Chloride would unite and form an explosive mixture.

What is Cochineal? Ans. It is from the earth.

Give source of Cream of Tartar? Ans. It is a metal.

What is the source of tannin? Ans. From minerals.

What is the source of lactic acid? Ans. Sugar cane. (Another said it was one of the salts of Opium.)

What is the source of Phosphorus? Ans. From the earth.

Meaning of capiat? Ans. Mix.

Meaning of Na. Br.? Ans. Hydrobromic acid.

Where or how do we get Cream Tartar? Ans. It is made in the laboratory.

What percentage of alcohol does the Pharmacopœia require in ordinary sherry wine? Ans. Forty and sometimes fifty per cent.

One applicant claiming to have had ten years' experience was utterly unable to give the number of grains of cocaine required in making a two drachm solution of four per cent.; guessing sixteen, ten and twelve grains.

From the report of 1892.

What is ergot? Ans. It is a root.

What do deuto., bin. and hypo., as prefixes, signify? Ans. Deuto. is single, bin. is single, hypo. is double.

How would you make pills of Nitrate of Silver? Ans. Soap would make a good excipient.

What are Nutgalls? Ans. A fruit of some plant.

What is ergot? Ans. The kernel of rye.

Name the officinal preparations of Mercury? Ans. Ointment of Mercury; don't think of any other.

What is Calomel? Ans. A Mercuric Chloride.

What is Kino? Ans. A Cathartic Gum.

What is a gum? Ans. An aqueous solution of fatty substances.

What is the source of Opium? Ans. Dug from the ground. Judge so from its appearance, resembling balls like potatoes.

From memorandums made during the year 1893, and not yet published.

Proto- and Deuto-Iodide of Mercury are the same.

Hypo., per. and sub. all mean strong.

Hoffman's Anodyne is Sweet Spirits of Nitre. Another said it was Tinct. of Iodine.

Camphor comes from the earth.

Spirit of Mindererus is made from Acetate of Soda and Liquor Ammonia.

Vinum Album Fortior contains 94 per cent. of alcohol.

Bismuth is an herb, and so is Subnitrate.

Simple Ointment is pure Vaseline.

Simple Cerate is Pure Wax.

Source of Pepsin is the gall of a hog.

Lactic Acid is used in ulcers.

Hirudo means hurry.

Fusion is evaporating a substance.

Secale Cornutum is Hemlock. (Another said it was the tops and leaves of some herb.)

Solution of Persulphate of Iron is used as a Carminative.

Solution of Subsulphate of Iron is a weaker preparation.

Lanoline comes from lard. (Another said it was from suet.)

To detect Calomel from Corrosive Sublimate, drop some of the powder in water and if it is Calomel it will dissolve right off.

Citrine Ointment is made by infusing Nitrate of Lead with Nitric Acid. (Another said it was a mixture of Hydrargyri Chloridi Citras one-half drachm with Petrolatum one and one-half ounce.)

A man twenty-seven years old said Nut Galls came from the gall of an animal. Many insist that galls are a fruit.

One list of drugs and liquids with answers given in full.

Liquids.		Solids.	
Question.	Answer.	Question.	Answer.
Paregoric.....	No answer.	Pulv. Alum.....	Cream of Tartar.
Syr. Tolu.....	Syrup.	Rochelle Salts...	Pulv. Alum.
Sweet Spirits Nitre	An Ethereal Solution.	Borax.....	Alum.
Soap Liniment	Camphor Preparation.	Bicarb. Soda....	Common Salt.
Tinct. Gent. Co....	No answer.	Pulv. Orris Root.	Marshmallow.
Fl. Ext. Ginger....	Highly flavored with Vanilla.	Pulv. Rhubarb ..	Rhubarb.
Syrup Squills.....	Syrup Preparation.	Quassia.....	Quassia.
Syrup Senna	No answer.	Goldthread.....	No answer.
Tinct. Catechu.....	Like an Opium Preparation.	Yellow Dock....	Yellow Dock.
Syrup Garlic	No answer.	Kino	No answer.

To prevent by statutes the "compounding and dispensing for medicinal purposes, drugs, medicines, chemicals or poisons," by those who exhibit ignorance of the every-day transactions in the average drug store, must be a benefit to the community and to all reputable pharmacists.

The writer asserts without fear of contradiction from any one, that to secure a certificate of registration in Massachusetts, and the same is doubtless true of every state in the country that has a pharmacy law, application, investigation and study, with practical experience, are an absolute necessity, and this necessity has increased the attendance in colleges of pharmacy, lectures by mail, and the demand for the many pharmaceutical journals, etc., resulting in better students of pharmacy than formerly.

It has been stated, that the injustice and absurdity of granting certificates to every one in business, is or should be a bar to any law, and some good and able men oppose pharmacy laws because they do not require an examination of every person in business when the law is enacted. Whether such law would violate the freedom guaranteed by the constitution or not, would be the first question to settle; but as every one knows who has had experience in legislatures, such a law could never be passed, and in many of our states, to legislate a man out of business would not meet with favor in the state: but when the state authorizes the issuing of a certificate, conveying certain privileges, it can suspend or revoke the authority it has granted. The reply to such an opponent would be, if you cannot get all you want for dinner, is it better to suffer the annoyance of hunger, or take what you can get?

The lofty, æsthetical or ethical position may be satisfactory to some conditions, and the day may come when it will be practical for all; but the average pharmacist to-day, must accept the conditions as they exist, or his clientage will be small and his income gradually diminish.

Section fourth of the Massachusetts Act provides, that any person "if found qualified shall be registered." These words seem to particularly reply to queries 2, 6, and 7, as the Board are not at liberty to register without examination. Should an attempt be made in this state for an inter-

change of certificates, or such acts as are designed in Queries 2, 6, and 7, the reply would be, "If the pharmacy laws are not a mere farce, it is no hardship to pay the fee of five dollars and be examined." Again, in these days when your National Pharmacopœia is almost a sealed book to many physicians, who largely rely upon pharmaceutical preparations and the novelties of their section, a good pharmacist for one state may be a poor one for any other locality. That it would be a matter of no little aid and assistance to a broker selling drug stores is true, but that is not a sufficient reason for a change in the law. Besides, if the certificate of any or every locality is permitted, how long would it be before certificates would be for sale by brokers to meet the saloon demand?

The following advertisement appeared in a Boston paper March 20th, 1893:

> Drug clerk wanted; a registered drug clerk to work about fifteen miles from Boston, or one who has a diploma to let. N. 402, Herald office.

The population of Massachusetts in 1885 was 1,941,435, and in 1890 it was 2,238,943, an increase of 247,478. From as careful a calculation as it is possible to make, the ratio of pharmacists to people in 1885, was one to seven hundred and eighty-two; in 1890 it was one to eight hundred and seventy-eight; and the quality in 1890, as compared to what it would have been without the pharmacy law, can be estimated by all who appreciate the answers given by those who have been refused registration.

At the present writing it is estimated from the efforts in 1891 and 1892, that with no pharmacy law in the state, the number of so-called drug stores would have increased, so that the ratio of proclaimed pharmacists would at this time have been one to five hundred.

With diligent, faithful work by the Board of Registration, fearless and persistent enforcement of the law, there is reasonable hope of elevating the standing of the educated pharmacists and removing the smirch that has been so hard for many of us to bear. If this work should be vigorously pushed in every section of the country, there would be a moral power and force very greatly aiding in the caustic and disinfecting process, so sadly needed in many sections of this country.

Since writing the above, it has occurred to the writer that a few words regarding the opponents of a pharmacy law as found in this state may give some idea of the antagonisms likely to be encountered in any locality. Those formerly in the drug business, now retired from active service and not up in modern pharmacy, yet interested in one, two or more stores from which they receive an income; those who have a larger clientage among the saloon druggists, and hold a mortgage of the stock; those whose means of living seem to be in starting new drug stores, having money but no pharmaceutical knowledge; those who can make and sell a large amount of simple preparations at most remunerative prices, and which any reputable pharmacist prepares himself; these and others of this kind have been our opponents, and can be found in every state.

THE CHAIRMAN: I desire to inform Mr. Whitney that on the first page of the paper, where the amendments are to be found, there will be a star inserted in the Proceedings, with a note to the effect that the amendments are presented in the Secretary's Report.

The following papers were next read:

QUERY NO. 1.—WHAT ARE THE BENEFITS, AND WHAT, IF ANY, THE LOSSES TO THE COMMUNITY AND TO PHARMACISTS, BY REASON OF THE EXISTENCE OF PHARMACY LAWS?

BY S. A. D. SHEPPARD.

That the education of its members is a benefit to a community is now such a self-evident proposition that it may be considered an axiom, and not a question for the settlement of which it is necessary to bring forward the proofs.

Compulsory education for those in early life is one of the fundamental principles on which alone a free and enlightened government can be founded.

The enactment of a pharmacy law by a State is a form of compulsory education.

All intelligent persons recognize that there is now going on, throughout the civilized world, an evolution of society, and that this evolution, like all those that have preceded it, is upward.

Pharmacy laws are one of the *very manifest signs* of this upward movement in a community—a movement toward the better protection of health and life—a movement for carrying this compulsory education beyond the point reached by the common schools.

That pharmacy laws have been enacted in almost every State of this free country, where the people rule, is certainly a proof that the people feel that such laws are helpful to their best interests, are highly beneficial to them, otherwise this form of legislation would not have progressed as it has; and when intelligent communities over and over and over again assert, by their free and untrammeled votes, that a certain kind of legislation is of benefit to them, the argument is a strong one in favor of the statement that such is the fact.

Now, what are these benefits that the people expect?

Pharmacy laws are a direct benefit to the health of a community.

They are also an indirect and, perhaps, a direct benefit, because they help to place one of the classes of men that make up the community on a higher plane of intelligence.

The movement for the enactment of pharmacy laws has not been hasty. Commencing about twenty or more years ago in this country, in good earnest, it has gone steadily onward.

The people in the States where only recently such laws have been enacted have had the experiences of the people in other States to guide

them in their action. Thus they have not acted hastily, and it is very significant that pharmacy laws are not easy of repeal.

The people of a commonwealth having for a term of years known the benefits of such a law, appreciate it and become firm advocates of such legislation.

The experience of Massachusetts is probably similar to that of all. We are strengthening our law. No one thinks of repealing it. On the contrary, the sense of our legislatures year after year is always now in favor of the law, because it is so very manifestly a benefit to the public health.

This then is the great argument on the people's side. Pharmacy laws are beneficial to public health, because they provide more intelligent dispensers of medicines. A premium is thereby put on that form of intelligence which is directly instrumental in helping the sick to regain their health.

That the candidates for registration as pharmacists are stimulated to exertion and study in such degree as could not otherwise be attained, is shown by the experience of Pharmacy Boards. Men try and try and try again for the coveted certificate, and between the trials they work earnestly to learn those things that are so necessary to make them safe men to put in charge of drug stores. It is for their financial interest to do so—and all this work and study are the direct result of pharmacy laws, because those who study for the love of it are not included in the class here referred to.

Further, many of the unsuccessful applicants at the doors of the Pharmacy Boards at last tire in their efforts, and leave the business to seek a livelihood in some other way in which they are better qualified to work.

This certainly is also a benefit to the community.

As men become more intelligent and populations become more dense, a necessity arises for many things not known in former times. The specialist in every branch of work, is one of the growing and very prominent factors in modern life. The community demands that each man shall understand his particular work more thoroughly than communities ever before required, and as men thus grow more circumscribed and thorough in their labors, they demand that in all matters pertaining to life and health, the state shall label those workers who are most competent to serve them; and so we find the certificate of the state here, there and everywhere, telling us that this man is a competent engineer—that such an one is a skillful dentist—and so on through the list.

Surely pharmacy is a branch of work where the label of the State that indicates competency, is needed as much and perhaps more than in almost any other branch.

What are the benefits to pharmacists?

Pharmacy laws are of the same benefit to pharmacists that compulsory education of the children is to the people as a whole. These laws ne-

cessitate a much higher grade of education and training, and in the generations of pharmacists that are to come, their effect will be very clearly seen, and the benefits arising from them will be more fully appreciated than at the present time when such laws are comparatively new.

The younger men of to-day are much better fitted for their work than those of their age fifty years ago, and to a certain extent at least this is due to the compulsory pharmaceutical education and training brought about by pharmacy laws.

It is true that clerks are scarcer than formerly and command higher wages. This indicates advancement in the character and value of the employees. At first thought some pharmacists may consider this not to be a benefit, because they pay more for the labor of their employees, but sober second thought will lead the intelligent man to think otherwise. His life work is perforce put on a higher plane than formerly. The discipline of the shop is steadied thereby, there are not so many changes. We get better clerks, and we keep them. They are better paid, do better work, and are better satisfied with their positions than formerly, and should an accident happen the pharmacist has a much stronger case before his patrons, if he can show by official record that he keeps competent clerks —men who have been registered by the Board of Pharmacy.

It seems to be one of the influences that will help modify and direct the change that is surely coming, viz.: the doing away with the small, cheap store—for the business of the future *must* follow the great trend of the times, and be done by large central stores in a great measure, and these pharmacy laws are guards to keep this coming movement in a somewhat reasonable shape.

Again, pharmacy laws are of benefit to pharmacists, because they are powerful agents in the work of keeping the liquor sellers out of our trade. This is one of the crying evils of the business, and everything that helps even in a slight degree in this direction is a very decided benefit to every good pharmacist.

ARE PHARMACY LAWS A BENEFIT TO PHARMACISTS?

BY JOHN H. MANNING.

I think so.

From the dawn of history until the invention of firearms, brute force ruled the world; but this discovery crystallized civilization, and from the protection to home and family came the slow process of working out those laws which best protected the public.

With the strange and fanatical belief that we ought not to profit by the experience of Europe, but little or no attention has been paid to the results accomplished by their stringent laws.

Those who expected to relieve the business ills of Pharmacy by legislative enactment, were like Hudibras' double-barreled gun that

"Aimed at duck or plover,
Recoiled and kicked its owner over."

The statutes could not hit those who would succeed under any circumstances—whose technical knowledge, tact and financial ability were such that success would come in any field, but those who claimed that the burdens of business were greater in our ranks than in any other business. Their disappointment has been so great that we can easily learn who has been "kicked over."

Another class—those who want to be let alone, who are opposed to any and all laws, who say "no laws are necessary to insure a proper conduct of their business"—from them comes the bitter howl. They fail to see the signs of the times.

Pharmacy laws have been enacted:

1st. Because the public demand skilled men in positions of responsibility. This is proved by the laws relative to pilots and ship captains, and the power of Boards of Health, inspectors of meat, etc., all of which reach one end—the protection of the public.

2d. Because it is the quickest relief for the present without injury. We are in a transitory stage. The time is not far distant when the public will say: "No one but graduates can practice pharmacy," and when we recall the present condition—training schools for all kinds of trades, cooking schools, trained nurses, technical schools—fitting students for the various industrial fields, we have abundant proof that the public are in it, and the tide cannot be stopped.

We can see the benefit of stringent laws in Germany—that wonderful country, the heart of music, the home of science. What immense industries have been developed in that country from the discoveries of examined pharmacists, the result of study under compulsion.

3d. The pharmacist will be benefited by the gradual growth of a profession out of a trade. By being compelled to fit himself in some lines, he will pay greater attention to all the details.

Pharmacy laws tend to raise the business to a proper plane, and weed out from the ranks of pharmacists unworthy members.

Lastly, because it is right. For this reason the laws ought to be most earnestly enforced. We shall better hold the confidence and trust of the public, if we say nothing of legislative restriction, but give it our hearty support.

You will recall Lincoln's remark, now an adage: "You may fool some of the people all the time, and all the people some of the time, but you cannot fool all the people all of the time."

PITTSFIELD, MASS., *July 1, 1893*.

THE REQUIREMENTS FOR GRADUATION IN AMERICAN COLLEGES OF PHARMACY.

BY C. S. N. HALLBERG.

With the great multiplication of Colleges of Pharmacy in North America within the last ten years, their status has become exceedingly questionable as compared with what it was previous to 1880.

The colleges now in active operation may be classified as follows:

I. COLLEGES CONDUCTED BY PHARMACEUTICAL ASSOCIATIONS.

Name and Location.	Form of Organization.	Number of Sessions.	Number of Weeks.	Number of Graduates.	Number of Instructors.
Brooklyn, N. Y	Association	2	28	.....	7
Buffalo, N. Y	Assoc. (Univ., Buffalo).	5	28	100	7
California, San Francisco	Assoc. (Univ., Cal)	20	28	200	5
Chicago, Ill	Association	33	28	800	7
Cincinnati, Ohio	Asso, (Univ., Cin.)	22	28	300	7
Cleveland, Ohio	Association	11	22	.....	3
Kansas City, Mo	.....	7	20	30	5
Louisville, Ky	Association[2]	22	20	200	4
Maryland, Baltimore	Association	42	28	600	4
Massachusetts, Boston	Association	26	32	225	7
Ontario, Toronto[1]	Association[2]	13[4]	16	.....	4
Montreal, Can	Association	25	24	150	4
National, Washington, D. C	Association	21	28	200	6
New York, N. Y	Association[1]	63	28	1,500	7
Philadelphia, Pa.	Association	72	26	3,500	7
Pittsburg, Pa	Association	15	20	125	4
St. Louis, Mo	Association	27	24	500	5

II. DEPARTMENTS OF STATE UNIVERSITIES, UNDER DIRECTION OF STATE PHARMACEUTICAL ASSOCIATIONS.

Name.	Department of.	No. of Session—1892–93.	No. of Weeks.	No. of Graduates.	No. of Instructors.
Iowa, Iowa City	University of Iowa	8	24	25	5
Kansas, Lawrence	University of Kansas	7	36	60	5
Michigan, Ann Arbor	University of Michigan.	25	36	600	9
Minnesota, St. Paul	University of Minnesota	1892–93	—	—	—
Ohio, Columbus	Ohio State University	—	28	—	5
Wisconsin, Madison	University of Wisconsin	10	28	100	5

III. PRIVATE SCHOOLS AND COLLEGES AFFILIATED WITH SECTARIAN AND OTHER INSTITUTIONS.

Name.	Department of.	No. of Session.	No. of Weeks.	No. of Graduates.	No. of Instructors.
Albany, N. Y.	Union University	12	24	150	4
Atlanta, Ga.	Atlanta Medical College	1–'91–2	.....	.....	3
Denver, Colo.	University of Denver	5	28	.....	4
Detroit, Mich.	Detroit College of Med.	1–'91–2	.....	.....	5
Howard, Wash., D. C.	Howard University	2–'91–2	26	.....	3
Illinois, Chicago	Northwest'n University[2]	11	23	200	7
Louisville, Women	Corporation	9	16	.....	4
Meharry, Nashville	Central Tenn. College	4	20	.....	5
O. Normal, Ada	O. Normal University[3]	2	10	30	3
O. National Normal	University, Lebanon, O.[3]	.....	10	.....	3
Oregon, Portland	Willamette University	5	24	.....	5
Purdue, Lafayette, Ind.	Purdue University	9	25	100	6
Scio, Ohio	Scio College.[4]	2–'91–2	20	.....	4
Tulane, New Orleans	Tulane University.	3	28	.....	3
Vanderbilt, Nashville, Tenn.	Vanderbilt University[2]	12	18	100	4

[1] Affiliation with University, but governed by Pharmaceutical Associations.

[2] Two consecutive terms in the year—one course.

[3] Four consecutive terms in the year—one course.

[4] Candidates examined by State Association Examining Board and Licensed.

Of these, Ohio, Ohio National, Normal, Scio and Northern Indiana may be regarded as purely business ventures, run in connection with some private teaching institutions.

Among these no reference is made to the recent institutions established in Richmond, Va., San Antonio, Tex., and other places.

The following have always been considered the requirements for graduation:

Age.—Legal majority twenty-one years. This requirement seems to be met uniformly. For women, eighteen years.

Experience in Pharmacy.—This has always been accepted as four years, the time of attendance at college included. Exceptions noted are: Kansas, two years: Michigan, none; Purdue, none, and the Normal-school colleges, variable; Scio, requiring examination by Ohio Board of Pharmacy.

Courses Required.—The usual standard is two courses: one course in each year, extended pretty uniformly to six months. This was deviated from by the introduction of the so-called summer course in the Chicago College in 1886, in the Illinois College in 1887, and Louisville in 1891. The same year it was abandoned in the Chicago College, in response to the sentiment of this Association, expressed by resolution at the thirty-ninth annual meeting, requesting the extension of the courses in colleges

to six months. The normal school departments require four courses of about ten weeks each, all within one year. The Ontario College has two consecutive courses of sixteen weeks, each in the same year.

The result of the introduction of two or more courses within one year has been that students may enter an institution and graduate within practically ten months' time! How absurd the proposition is, that the average young man, without much preliminary pharmaceutical knowledge or training, may acquire sufficient of either, in this short course of time, to qualify him for graduation, or that such average graduate will have the knowledge and experience required to render him a useful member of the pharmaceutical profession.

The Degrees—The unostentatious title has been "Graduate in Pharmacy," Ph. G., until the advent of the National College at Washington, D. C., with "Phar. D.," the University of Michigan school, with the degree of Pharmaceutical Chemist, with the title "Licentiate," in Montreal and Ontario. The Michigan School, not requiring any experience in pharmacy, and its instruction being particularly extended into chemistry, the title is perhaps more in accord with the qualifications of its graduates. One institution has, however, recently made a distinction between these two titles, which makes an invidious comparison, and one which the American Pharmaceutical Association, in justice to itself and the many institutions represented in its membership, cannot afford to ignore.

In the annouucement of the Illinois College of Pharmacy of the Northwestern University, a sectarian institution, two distinct titles are presented for graduation:

(1) The degree of "Graduate in Pharmacy," for completion of two consecutive courses, nominally of twenty weeks each, and

(2) The degree of "Pharmaceutical Chemist," for completion of two courses, of about nine months in the first year and eight months in the second year.

This announcement declares substantially that the degree of Graduate in Pharmacy is not good enough except to be an intermediate title to that of Pharmaceutical Chemist.

With this resume the proposition is presented that the time has come when the American Pharmaceutical Association should establish and maintain some standard as to what constitute requirements for graduation. Twenty pharmacy laws recognize "diplomas of some reputable colleges of pharmacy." How may "reputable colleges" be distinguished?

MR. HALLBERG: This paper has been presented for the purpose of calling the attention of the American Pharmaceutical Association to the necessity for putting a stop to those institutions which claim recognition for their graduates in pharmacy under the pharmacy laws, without stating anything about what is understood by proper requirements of graduation, or what they represent. Mr. Carteighe's excellent address, this morning, on the condition of pharmacy in Great Britain, ought to open our eyes to the

absolute necessity of coming squarely to the front and indicating the proper conditions for graduation, in a reasonable way. There are three conditions which it is necessary for us to maintain, namely, the age qualification, the experience qualification, and the requisite number of courses to constitute the requirements for graduation. For this reason, and in order to obtain the sentiment of the Association on the subject, I now offer the following resolution:

"RESOLVED: That the following conditions shall determine what constitutes recognized colleges of pharmacy, that is, the requirements for graduation are: 1, age, 21 years; 2. experience in pharmacy, four years, including time at college: 3. two courses of at least six months each, extending over more than one year."

(The resolution was seconded.)

MR. EBERT: I do not think that our time should be taken up with a discussion of this kind, because it seems to me to hinge on the old Chicago fight. Our time is certainly too valuable to be occupied with such matters. I therefore move as an amendment, that this subject be referred to a committee to report one year hence upon the advisability of passing such a resolution as that presented by Mr. Hallberg.

MR. SHEPPARD: I am heartily in favor of the resolution, for it strikes deeply at the root of an important matter in the curriculum of our colleges and their management. Nevertheless, I think it is so important that it would be well to have it referred to a committee, to report thereon this afternoon. I therefore move, as an amendment, that the matter be referred to a committee, to report at the next session.

MR. EBERT: I offered an amendment to the effect that the matter be referred to a committee who should have a whole year's time to consider it, and afterwards present it to us in such a shape that we could calmly discuss the question. While the American Pharmaceutical Association has always favored advanced education, and has done everything toward raising the standard of colleges of pharmacy, it has also had a sad experience in years past in attempting to regulate colleges of pharmacy. I can, myself, recall the experience of nearly fifteen years when we have met together for the purpose of regulating the different colleges of pharmacy, and endeavored to set up a standard for them. The time spent in such an attempt has been only wasted, and I therefore hope that the few hours we have allotted to our sessions will not be taken up in discussing a matter that can be more profitably referred to a committee. If that course is followed, we can receive that committee's report and discuss it when we meet quietly in North Carolina next year, without danger of arousing a certain irritation that exists in Chicago with respect to this important question. I make this proposition for the good of the Association; for we do not want to excite any ill feeling here, and you will certainly do the druggists of Chicago a great service, if you will avoid a discussion of this subject at the present time.

MR. MARTINDALE: I am certainly in favor of the sentiments expressed in Mr. Hallberg's resolution. It is exactly in the same line as that in which we are working for reform in our English system—namely, that there ought to be a regulated course of instruction passed through before a candidate is entitled to examination. With this object in view, we have, on several occasions, had bills presented in Parliament for the purpose of establishing a recognized curriculum, such as Mr. Hallberg proposes, grafting that on to our present system, as Mr. Carteighe so ably expounded this morning, providing an apprenticeship or its equivalent, three or four years' course of work in a pharmacy, and then a curriculum, if you prefer, covered by a course of study ranging from two to six months. That is exactly what we are aiming at in Great Britain. I foresee, however, that in this country you will meet with a great difficulty, from the fact that there are so

many colleges of pharmacy, each having different standards of graduation, and so many varying State laws in regard to the right to practice pharmacy.

If it were possible, it would be of great benefit to you to have an Act of Congress passed, providing that all colleges should be under State inspection, so as to make their courses even and uniform. Have them inspected as our British Society is inspected, by having inspectors from the Privy Council to supervise the examinations in London and Edinburgh whenever examinations take place. These examinations are thus brought so well into accord that the passing of one is equal to the passing of the other, and there is no clashing. I must say, however, that Ireland has home-rule enforced. A few years ago we wanted Ireland to join with us and conform to our laws; but the Irish authorities could not consent to this. They are so adverse to being under British control that they have a pharmacy law of their own, and conduct their own examinations; but there is this difficulty about it, that, although a man may pass the Irish examination, he can only practice pharmacy in Ireland, while, on the other hand, the man who passes the British examinations cannot practice there. You will perceive, therefore, that you have gotten into the position in which we find ourselves with respect to Ireland; you have laws that clash and colleges of pharmacy that conflict. If, however, you could get an Act of Congress passed to make your boards all work together under government inspection, I believe it would remedy the evil.

THE CHAIRMAN: For the information of Mr. Martindale, I would say that such an act of Congress could not be passed, because it is contrary to our constitution.

MR. SHEPPARD: In answer to the remarks made by Mr. Ebert a few minutes ago, I would say that I would be very far from wishing to bring up any question here that might cause unpleasantness among our Chicago friends. I did not apprehend, however, that such was the case, but I do see that there is a very far-reaching character to this resolution in this respect, that as pharmacy laws are increasing in number throughout the United States more colleges of pharmacy will necessarily spring up, and there will be a great difference (and there is already) in the nature of the instruction given in such colleges. Now, it is very desirable, from the standpoint of the Massachusetts College, that when we differ as to accepting a student who has passed one course in a recognized college, to have some such authority as this Association provide a well defined rule, stating what shall be considered a recognized college of pharmucy whose course of instruction for the ensuing year we will accept. That is the point directly at issue in my thought, and I still hold to the idea that it will be a good plan for a committee to whom this resolution might be referred to report at our next session, even if they only report progress. If that committee should find, on consideration of the subject, that it is so broad a one and so large a one that they cannot give it the consideration it deserves in the time intervening between this session and the next, then further time can be granted upon request, and they can report at the next annual meeting. But I hope that the matter will not be postponed for another year if it can be settled at this time.

MR. EBERT: I believe it was nearly twenty years ago, although I cannot exactly recall the time, when this Association took it upon itself to denounce one of the best institutions in the land. I was one of those who took a prominent part in this action, and who at the time felt that it was necessary to oppose no less an institution than the University of the State of Michigan because its faculty did not agree with us in the matter of curriculum. Time has passed, and now when I look back and see who were the men that gave instruction in that University, and the vast amount of good they have done for the American Pharmaceutical Association, I feel, as do many others, that we ought to get down on our knees and ask pardon for the adverse action that we took, in years gone by. Now, sir, I feel that any committee that might be appointed to report on this subject at our next session could present only a mere thought that might be evolved in their minds

between now and then. This is a broad question, and the American Pharmaceutical Association should not place itself in the position of criticising any man's work, when he is earnest in doing his duty according to his own belief and is trying to do honest work. I have been as aggressive as any member of this Association in the past, but have seen my errors afterwards, and see them daily, and therefore I do not want the Association to make mistakes of which we have been guilty in time gone by. This committee should have plenty of time to consider the matter presented to them, and thus be enabled to make a complete and valuable report.

MR. ROGERS: It is not my intention to criticise the colleges or any set of men. The Michigan lesson taught us very well. A certain college in Kentucky cost us $7,000 at one time because we refused to recognize their diploma. Two years ago a certain college established a summer school, although not with the consent of a large majority of those connected with the college, but through an appeal from the young men from the South. Just before I came to Chicago, the Board of Directors held a meeting and concluded that the experiment, so far as it was educationally concerned, was not a success; nor was it successful financially. I am satisfied that before another six months pass, the last summer school will have been held by the Louisville College of Pharmacy. I want to say further that any action that this Association may take with regard to the requirements of age and educational qualifications will be approved by the Louisville College of Pharmacy, and its directors will conform to your decision.

MR. HALLBERG: I simply desire to point to the fact that the American Medical Association grappled this question, and they had more than thirty odd institutions to deal with. They had, I believe, 180 medical colleges to confront, not even organized by medical societies, but by stock companies, comprising all sorts of schemes and lying fakes; but in spite of this the American Medical Association took hold of the question, and now look at the result of it. To-day there is not a medical college of any standing in the United States which does not require a four years' course. Is it possible that the American Pharmaceutical Association, having only to deal with colleges that are conducted by its members, almost without exception, is not able to do with these few colleges what the American Medical Association did with a great horde of medical colleges? Mr. Ebert used to say in regard to matters of legislation, "You should pay no attention to lawyers, because they always look backward. You should look forward and not backward." It seems to me that lately he has been looking backward entirely too much. Let us settle this question. As to the question being a new one, or one brought suddenly before the Association, we know very well that there is not a man connected with any college of pharmacy in the United States, or any one present at this meeting, who has not considered it for the last three or four years. Further than this, it is an insult to our intelligence to be told now that we can turn out graduates in pharmacy in a period of ten months, and that where they have not had the four years' experience, but only have had thirteen months' experience, the diploma will be withheld three years until they have acquired the requisite experience. This is the condition of things, and it is the duty of this Association to put a stop to it. The resolution does not go into details. It does not ask for even preliminary education, which is a very important thing. Let us have the three fundamentals which we always did have until a few years ago. The fact that the Association failed then is no reason why it should fail now. It is a duty it owes to pharmacy, to its members, to colleges, to education, and to progress in our professsion.

THE CHAIRMAN: There seems to be some misapprehension on both sides with respect to this resolution and its meaning. As it stands there could be no recognition of the University of Michigan at all. That would be thrown out of recognition, and we should not recognize it. It would be the same with regard to the University of Lafayette.

MR. HALLBERG: There are only two institutions which do not require experience, and those are Purdue and Michigan. Should their graduates be entitled to recognition as efficient pharmacists unless they have had experience in pharmacy? I defy any man to stand up here and say that they ought to be.

THE CHAIRMAN: It seems to me that if the resolution applied only to those gaining the degree of Ph. G., it would make it a little better, for I believe that we should have the same condition in Pharmacy that exists in ordinary eduational institutions in this country. They have Bachelor of Arts and Bachelor of Science, Doctor of Philosophy and Doctor of Science. The requirements in both are equivalent in quantity but not in quality. No one can gainsay the fact that the requirements in the University of Michigan are so excellent that it would be well if other colleges of the country could imitate them as far as they can be imitated. That college aims at giving not graduation in pharmacy, but graduation to pharmaceutical chemists. That is the degree they give, and they aim at that work and do it well. Now, we should not rule anybody out who aims at a different result, but if they aim at graduation in pharmacy it would be well to insist upon this. A weak point exists in this resolution as it stands, even with this qualification, which is that it is very easy for a college to extend over six months, and during the six months have only six hours of instruction. Of course, I am exaggerating and making it broad, so that the point will be easily seen. They can extend six hours of education five months throughout the winter, or six months, and have only a few hours' teaching. Now, I think the resolution, instead of saying that during the year they shall have six months' teaching, should state how many hours teaching in the laboratory students shall have during the six months.

MR. FORD: The resolution ought to further state how many hours teaching the school should have, and how many hours each pupil should have; for the hours of teaching at some instiurions may be arranged to take in twenty-four hours in a day, while others may not have one or two in a day. I think the resolution as read is vague, and none of us understand it.

MR. HALLBERG: Why not add the number of professors and laboratories the institutions shall have? We cannot go into these details. You have simply to come back to the former proposition. Perhaps in a few years' time we can make it more definite; but you cannot go into anything more definitely now than this proposes, unless it is to embody the recommendation made by the Chair with reference to the substitution of the title instead of the college. We recognize the force of that, because it would leave out the University of Michigan, and not come in conflict with any titles, as suggested by the chairman.

Mr. Sheppard's amendment that the resolution be referred to a committee, to report at the next session, having been duly seconded, was put to a vote and carried.

The Chair thereupon appointed upon said committee, Messrs. Sheppard, Simon and Ford.

The Section then adjourned until 3 o'clock.

SECOND SESSION.—THURSDAY AFTERNOON, AUGUST 17.

The second session of the Section was held in Hall 22 of the Art Palace, and was called to order at 3 p. m., by Chairman Eccles.

On motion, the reading of the minutes of the previous session was dispensed with.

The Proceedings were opened with the presentation of the Secretary's annual report,* which was read by Mr. L. C. Hogan.

MR. STEVENS: I think that the Secretary ought to be granted an adequate compensation for the amount of work he has to perform, so that he may be enabled to present the report in a more tabulated form.

MR. HOGAN: At the New Orleans meeting the Secretary was instructed to collect information regarding colleges of pharmacy and pharmacy laws, and fifty dollars were voted to cover the expense of gathering such information at that particular time. Nothing was said about what should be appropriated at any future period. I would say further that I did my best to secure this information about the colleges of pharmacy, and for that purpose addressed many letters of inquiry to those who were in a position to impart reliable information, endeavoring also to keep track of every pharmaceutical department in the United States, some forty-three in number. I was at a loss to know what the Association wanted in the way of information, having no data to go by, no precedent, and no instructions. However, I went through the information I received by mail, and what I did not get by mail I secured from prospectuses, etc., and in this way I made up an epitome of the requirements of each college and sent it to the Association at the White Mountains meeting, in the shape of some forty-seven closely type-written pages of matter. It was in an unfinished condition, and I fully expected that it would be referred back to me, with definite instructions as to what should be done towards completing it. I wrote to Mr. Maisch and asked him what was done with this report, and he replied that it had been referred to the Chairman of the Publication Committee. I wrote to the Chairman of that Committee in regard to the matter, but received no answer from him. I wrote a second and third time, and then received a reply from him to the effect that there was no need to hurry about the matter, and that as soon as he had time to look over the report he would do so. I then commenced to correspond with Mr. Maisch again on the subject, and every time he would answer referring me to previous correspondence which stated that the report had been referred to the Chairman of the Publication Committee. Finally I received a letter from Mr. Maisch, stating that he heard from the Chairman of the Publication Committee that the report could not be published, that it could not be condensed, and that there was no way of distinguishing between sham colleges and those of recognized standing. Since then, I have heard no more about the report.

MR. TORBERT: I would like to inquire of what value it might be to the American Pharmaceutical Association to publish either in full or in part certain correspondence that questions either the value of pharmacy laws or pharmaceutical colleges, or the general interests of pharmacy? Such letters have been read here. For instance, one gentleman writing from Indiana asserts that all pharmacy laws should be repealed. Certainly the American Pharmaceutical Association holds no such views, and there can be no value, it seems to me, in the interest of pharmacy, to give circulation to a synopsis of that statement, however true or untrue it may be. It would be my own idea that those are merely the views of individuals, and might be properly filed in the archives of the Association; but I would not deem it advisable to have either the correspondence in its entirety or a synopsis thereof published in the Proceedings of the American Pharmaceutical Association. It, of course, takes the form of a controversy, and becomes entirely a controversial

* The report will be found as an appendix at the end of these Minutes.

issue, and we care nothing for that. We will reach our conclusions on the subject, and those conclusions will be matter for publication. I do not think we ought to go into those details presented by the Secretary.

MR. WHELPLEY: I move that the correspondence referred to be recived and filed.

The motion was seconded and carried.

MR. ROGERS: For the information of the Secretary, I will state that on the first of October Kentucky will have a new pharmacy law, embodying about the same points as the old law, with this exception, that there will be sections covering the sale of poisons and restricting substitution; also providing that the Board shall do the State analyzing. A new revenue bill that was passed by the legislature, requiring the druggists in the State to pay a license of fifty dollars for the privilege of selling whiskey, was opposed by the druggists of the State, and has now been taken into the Court of Appeals. The new charter of our cities allows us to sell admixtures of alcohol only, and provides for a license, costing $22, to be obtained by druggists who sell whiskey. This will also be fought in the courts, but our new law in the main will be about the same as the former one.

Mr. Hogan here occupied the chair while Dr. Eccles took the floor.

DR. ECCLES: Some remarks have been made by our friend from Dubuque regarding the doubtful benefit which might accrue from the tabulation of the letters presented by the Secretary, one particular case having been cited by him, and I desire to say a few words on this subject. In the address which I read to the Section this morning I called attention to the fact that it would not be a wise policy for any man to try to keep a bank account, or a ledger account, by only posting all his credits or everything that should go to the cash account, but at the same time should put down nothing on the debit side (to hide that part, so to speak). Such a course would be the act of an insane man, who would think to delude himself with the idea that he had a bank account, although he might not have a cent to his credit at the bank, or had drawn more than his bank account stood for. Now, I hold that this is exactly what is being done in every kind of legislation by us at the present stage of our civilization, not only in pharmacy legislation, but in every kind of legislation—that a large number of people are afraid to face the facts they do not like to face. They fail to see that no legislation can be undertaken that is not bad as well as good. There never was a law passed that did not have a bad side as well as a good side, and the way to discover whether a law is good or bad is not by suppressing the bad, but by fairly and squarely setting both sides in the balance, putting in one side the one and in the other the other, and thus finding out which is the heavier side. There is no other way in which any one can come at the truth with regard to any law, and it matters not what the law is. Therefore, to suppress counter opinion by counter fact is simply to hide our heads and think that we are hidden altogether from the hunter, as some animals do when hunted. We must not do that, but must hear the facts on both sides. We as pharmacists know very well that a pharmacy law is necessary for the progress of pharmacy in the future; but in order to avoid making false steps we must encourage the enemy to come forward and then knock him down with our facts, not suppress him by gag-law. Now, I was in hopes that Mr. Berry would be here to defend his side of the question: In fact, I hoped that a number would be present to talk on his side of the question; but they seem to be afraid, for some reason, though I will not pretend to say what reason.

We have a paper here from Dr. Bowker, of Boston, Mass., the only paper on the subject, I suppose, that has been presented; and in order that we may have a good chance to fling at him, I believe it ought to be read not by title, but in full. However, I will leave that to the sense of the house.

(Dr. Eccles resumed the chair.)

A paper was presented by the Secretary entitled "Legislation in Pharmacy," by Dr. H. L. Bowker.

MR. HALLBERG: From what I have been able to learn of this paper, I believe it should have been presented to the Section on Commercial Interests, because it deals solely with business matters. For this reason, I suggest that it be referred to the Commercial Section.

THE CHAIRMAN: The paper is devoted to the subject of legislation, but you can dispose of it as you see fit.

MR. ROGERS; Is the writer a member of this Association?

THE CHAIRMAN: He is not.

MR. ROGERS: Then I think the paper should be read by title.

MR. ALPERS; Is there any regulation about authors of papers being members of the Association?

THE CHAIRMAN: There is none.

MR. ALPERS: It seems to me that we ought to insist that every author of a paper presented to the Association should be a member.

MR. WHELPLEY: I believe that only members of the Association have a right to present papers without a special vote of permission.

MR. FENNEL: Any man connected with the profession of pharmacy may send a paper to this Association, and it remains at the discretion of the Chairman of the Section to which it is presented whether it is worthy of acceptance. If the Chairman of the Section finds it worthy of acceptance, he has the right to accept it on behalf of the Section.

MR. MARTIN: For information, I would ask whether the Chairman considers there are any valuable points in that paper? I believe we shall all be willing to leave the matter to the decision of the Chair.

MR. WHITNEY: I wish to say to the Section that I know the writer of that paper intimately, and know that he is the greatest enemy of pharmacy legislation that ever existed between Maine and California. He opposes us in Massachusetts on every occasion, and defeats us by every means in his power. Thus far we have been able to lay him down l w and bury him deep, and it would be too bad if he were to now be resurrected by the American Pharmaceutical Association, when the State Board of Massachusetts has buried him so well.

THE CHAIRMAN: My view of the matter is this: If they have a strong side we should know it, or if they have a weak side we should also know it, and then we can the easier bury them. I am confident myself that they have a weak side, and it is to expose the actual weakness of it that I have permitted the presentation of this paper. The weaker their side, the better it is for us.

MR. WHELPLEY: They may have a weak side, and this may be a weak paper, but I don't think that any one present wishes to build straw houses solely for the sake of blowing them over. After hearing that this gentleman is a resident of the great city on the Eastern coast, where he has had every opportunity of becoming acquainted with pharmaceutical associations, and then does not even join the American Pharmaceutical As-

sociation, or is unable to do so, I do not think we should recognize his protest to the extent that we would recognize one coming from a fellow member. I therefore move that the paper be rejected.

Mr. Torbert: While the motion is pending, I desire to say a few words in relation to this paper and the chairman's remarks. I remember that in his address this morning he paid a beautiful tribute to the theory of induction. Now, it happens that the consensus of pharmaceutical life and wisdom, not only in this country, but in the countries of Europe, declares for pharmaceutical legislation. For this reason, it does not seem to me that we need at this date, when both the fact and the theory have been established, to discover and emphasize the objection of some man who either from want of wisdom or otherwise declares against it. Consequently, I have asserted, as some of you may recollect, in a pharmaceutical journal, and with good reason, that it is a wrong conception or theory to assume that pharmaceutical legislation is not in the interest of pharmacy. The position I take is otherwise, namely, that the pharmaceutical legislation we have in these days is primarily in the interest of the people. We know that we can stand here and pose as the controllers of the law, but the fact is that the people of this country cannot afford to have pharmacies conducted without pharmacy legislation which shall secure competent men for the work. This being the case, I must protest against a discussion taking place this afternoon with regard to allowing a certain man who is a root-beer maker, and a non-member of this Association, to raise objections and reflect on the wisdom of the best pharmacists of this country and Europe, and against the legislation which the wisdom of those pharmacists has wrought out for the people in the statute books of the various States. Such a discussion is unnecessary, and I am sorry that so much valuable time has been wasted on the subject.

Mr. Whelpley's motion to reject the paper having been duly seconded, was put to a vote, and unanimously carried.

The Chairman: I must say that while I agree with you in your opinion, I do not think it is a wise policy to pursue such a course as the Section has seen proper to take.

Mr. Whitney: Excuse me for differing with you on this subject. If you knew Dr. Bowker as intimately as the people of Massachusetts do, you would not consider his opinion of any value whatever.

Mr. C. S. N. Hallberg read the following paper:

DRAFT OF A BILL TO REGULATE THE SALE OF PATENT MEDICINES.

BY C. S. N. HALLBERG.

The conservation of the public health has always been a subject of paramount importance to legislators.

In the manufacture and vending of ordinary commercial articles, the public requires no legal protection, as the quality, durability and value of such commodities are generally easily determined by the user. Even in the articles of food and drink the consumer eventually learns the quality and value of the different substances and their products; and but for the necessity of guarding against gross adulteration and sophistication impairing the physical health, no supervision would be required in the vending

of the products of the farm, dairy, grocery, spice-mill, and the numerous related manufactures.

In the interest of the public health the necessity of guarding against the contagious diseases, the indiscriminate practicing of medicine, pharmacy and dentistry, has been recognized in nearly every State of the Union.

But amid all this restriction and supervision recognized as indispensable to protect the public health and enacted as laws by nearly half a hundred legislatures, stalks a specter of death and destruction, claiming its victims from the babe in the cradle to the decrepit octogenarian, enjoying a quasi-protection under certain copyrights and trade-marks, known as the proprietary medicine, or incorrectly "patent medicine" traffic. Despite the restrictions with which our wise legislatures have surrounded the application of remedies in the alleviation of pain and suffering, and the curing of disease, persons without qualification of any kind or character are permitted the privilege of becoming, through ignorance, criminality or cupidity, instruments of death and destruction. Thousands of babes have their mental faculties impaired for life through the subtle poison, morphine, sold broadcast over the land in the form of "soothing syrups." Many a drunkard recollects the time when he first began "the tipple" masquerading under the name of some alleged "tonic" or "bitter." Many a female could testify to the numerous preparations on the market for the exclusive use of unnatural mothers. The insane asylums, alms and poor-houses, jails and penitentiaries, are filled with the wrecks of humanity, who innocently were led to believe that from some secret compound or nostrum they would obtain relief, whilst instead they have found physical impairment, mental and moral degradation and destruction, and all but a living death.

Such a condition is barbarous, and one that should not be tolerated in a civilized community. In older countries in Europe no such traffic is tolerated except under such supervision as to make it safe, and thus utilize Nature's resources, the grandest gift to mankind for the relief of suffering and disease.

THE DRAFT.

Be it enacted by the People of the State represented in General Assembly:

SECTION 1. It shall not be lawful for any person or persons, by themselves or their agents, after January 1st, 1894, to sell or offer for sale, in the State of Illinois, any proprietary compound, either liquid or solid, in packages, boxes or bottles, to be used as a medicine, without such package, box, bottle or container having attached on the outside a label or wrapper, upon which shall be printed in plain, Roman type, the ingredients contained in such box, package or bottle by their correct English names, with the quantities of each expressed in United States or Metric System of Weights and Measures.

SEC. 2. As proprietary medicines, within the meaning of this act, shall be designated all mixtures of medicinal substances for internal or external use, commonly termed "patent medicines," whose composition is kept secret; provided that nothing in this act shall apply to the sale of, or dispensing, by legally qualified persons, any preparation or mixture, solid or liquid, of medicinal substances, whose formula is recognized in the Pharmaco-

pœias of the United States, Great Britain, Germany, France and Sweden, nor the United States, National and American Dispensatories, the National Formulary and the Homeopathic Pharmacopœia.

SEC. 3. Any person or persons, by themselves or their agents, who shall sell or offer for sale any proprietary compound, either liquid or solid, for internal or external medicinal use, without having printed on an external label or wrapper attached thereto, in plain Roman type, the ingredients composing said compound in their correct English names and the quantities of each ingredient expressed in the United States or Metric System of Weights and Measures, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than twenty-five dollars nor more than two hundred dollars for each such offense.

Any manufacturer who shall through himself, or any agent or employee, change the composition of any such compound or mixture within the meaning of this act, by alteration, omission or addition of any medicinal substance, or substances without plainly indicating such change on the external label or wrapper of each package of such compound, shall be guilty of a misdemeanor, and upon conviction be fined not less than one hundred dollars nor more than five hundred dollars for each offense.

One-half of all fines collected under this act shall be paid to the person prosecuting said suit and the other half shall be paid to the Department of Public Charities and Corrections of the county in which such conviction has been obtained.

SEC. 4. This act shall take effect January 1st, 1894, and all packages of proprietary compounds, within the meaning of this act, now on sale, must after said date be provided with labels in conformity with this act before being offered for sale.

SEC. 5. All acts and parts of acts in conflict herewith are hereby repealed.

MR. WHITNEY: I don't quite catch the sense of the application of this paper. I would therefore inquire whether it is designed for Congressional action or legislation in various States?

MR. HALLBERG: My idea was to prepare a draft of a bill which could be given wide notice and serve as a guide for pharmacists in different States, whenever they have an opportunity to present a bill of the kind to their legislatures. The question has been before this Section for many years past.

MR. WILLETT: That paper calls to mind something that happened two or three years ago in my State. We got up a bill similar to the one presented by Mr. Hallberg, but it brought down on us all the patent medicine men in the State like a flock of wild pigeons. We attempted to make it a felony to sell a patent medicine without the formula, but they opposed us at every turn with their moneyed influence, and we were not in it.

MR. WHITNEY: For the purpose of bringing the matter before the Section, I move the acceptance of the paper for publication.

The motion was seconded.

MR. WILLETT: I don't see any use in our attempting something that we cannot possibly accomplish, If you consult a reliable attorney in reference to any case you desire to undertake, he will not advise you to proceed unless he believes, with a degree of certainty, that he is going to win it for you. Now, I fail to see how any idea expressed in such a paper as this can be profitably taken up by pharmacists in the different States, and how time and money expended in that direction can accomplish any good for this Section or any other Section. I think it would be simply a waste of time and money on the part of druggists to attempt such an action as that proposed, and I believe we can work to much better advantage by fighting the evil in some other way. The

patent medicine manufacturers have as much right to exist in the United States as we have.

THE CHAIRMAN: The speaker should keep to the question, which concerns the acceptation of this paper.

MR. WILLETT: I am endeavoring to explain why the paper should not be printed. As I have tried to show, if the paper is printed, it may be acted upon by pharmacists in various parts of the country, who might attempt to carry out the ideas expressed in it, and it would simply be encouraging them to engage in work which would be utterly unproductive of good results

MR. FENNEL: This paper does not belong to this Section, I believe, but should have been presented to the Section on Commercial Interests. There is one defective point in the proposed bill, and that is, who is going to prosecute? We have precisely the same law in the State of Ohio, and it is futile. I move, as an amendment, that the paper be referred to the Section on Commercial Interests.

The amendment was seconded.

MR. MARTIN, of Chicago: If this is not pharmaceutical legislation, I would like to know what else it can be termed? If we are not trying to knock out patent medicines, what do we have a Commercial Section for? Do we not recognize that this industry is one of our greatest enemies, and that there are millions of dollars' worth sold all over the country, thus diverting money which rightly belongs to the retail drug trade, in the way of prescriptions and regular drugs? We know that to be the fact, and that the majority of these patent medicines are frauds, that they have been examined and analyzed time and again, and proved to be of fictitious value, although commanding an enormous and inconsistent price. The gentleman from Missouri (Mr. Willett) seems to be positive that this proposed act can never be enforced. It is rumored that there is a combination among the patent medicine men with millions of dollars to fight anything of this kind, it is true, and I believe it is not disputed; but when the patent medicine combine has to grapple with pharmacists in forty-eight States of the Union, and each State attempts to pass the law, their millions will not reach so far; and it will be a good thing to put this law in public print, so that every pharmacist or organization of pharmacists in the country may take notice of it and make the first attempt.

MR. ALPERS: As to the theoretical law, it might do no harm to publish it, but as a matter of practice it amounts to nothing. Such a law as the one proposed can never be passed and every one who has had any experience in legislation must know it. If, however, we were to argue the question as to whether it is desirable to pass such a law, I should say it is not. I consider that patent medicines are not medicines in the true sense of the word. They have the name, but they are not medicines in the sense that pharmacists should regard medicines. They stand on the level with glue, or anything else that we handle, because custom compels us to handle them. We are compelled to do so because we have to make a living by engaging in little side branches of every kind, and patent medicines form one of those side branches. To make the druggist the authorized agent for the sale of these articles is degrading to our profession. They do not belong to our profession at all. This question, however, will probably be argued at greater length in the Commercial Section. At any rate, I believe it is not a wise thing, on this account, to publish this paper in connection with the proceedings of this Section.

MR. PATCH: When we consider the nature of the articles appearing in the publications of this country for the last two or three years, and the hours upon hours and the

days of discussion in State and National associations, involving the wholesale drug trade, as to how the immense traffic in patent medicines that has been built up by advertising shall be kept in the hands of the druggists, it seems to me that the attempt to enforce such an act as that proposed is very much like killing the goose that lays the golden eggs. It seems to me that it is very inconsistent.

MR. HALLBERG: I don't like to take up the time of the Section, but merely wish to say that the intent of this proposed act is simply this: One of the best suggestions, I believe, that have been made with reference to the patent medicine question is, that in every pharmacy law there should be incorporated a section (as was done in the Colorado law, passed last year, I think,) providing that no one but a registered pharmacist shall be allowed to sell patent medicines. Now, if patent medicines are simply regarded on the level of tooth-brushes and articles of that kind, then, of course, it would be inconsistent; for pharmacists would have no right to the control of patent medicines considered on a purely mercantile basis. But in connection with that we have a law that requires every bottle of patent medicine to have the formula printed on the label. When that is done, the pharmacist can claim the complete monopoly. Why? Simply because he is the only man qualified to judge, next to the physician, as to whether such medicines or combinations of remedies can be used with safety. For that reason, he alone should be the custodian of patent medicines, and have the sole right to sell them to the public. I hold further that we cannot claim this privilege for druggists unless they know the contents of the patent medicines. Without this privilege, the groceryman or hardwareman is just as competent to take a bottle of medicine from the shelf, wrap it up and hand it to the customer, as the most highly qualified pharmacist is to-day. But when you require that the retailer shall know what the medicine contains, and lodge responsibility with him, then we have a right to claim the monopoly in the sale of it.

MR. EBERT: I think the proper disposition to make of this paper would be to send it to the right place. The right place is Washington, where there is a National Board of Health to look after the national health of this country. We had better present the paper to that Board, or have Mr. Hallberg send it to them, with a view to having a national law passed which shall have the same effect; but do not let us pass it in our own States, because we cannot enforce it. It should be a national law if it is to have any effect whatever.

Mr. Fennel's amendment, that the paper be referred to the Section on Commercial Interests, was put to a vote and was lost.

Mr. Whitney's motion to accept the paper for publication was then voted upon, and was carried.

The following papers were read:

"Would it be a gain or loss to Pharmacists to compel apprentices to pass a Board of Pharmacy examination on their general education before permitting them to begin work in the drug store?" By Rosa Upson, M. D.

"More chemistry needed—a plea for the extension of this branch of a pharmacist's training." By Alfred R. L. Dohme, A. B. Ph. D.

"Query 7.—Should any candidate be permitted to graduate in pharmacy before he is able to apply the tests and assays of the United States Pharmacopœia?" By Dr. Wm. Simon.

WOULD IT BE A GAIN OR LOSS TO PHARMACISTS TO COMPEL APPRENTICES TO PASS A BOARD OF PHARMACY EXAMINATION ON THEIR GENERAL EDUCATION BEFORE PERMITTING THEM TO BEGIN WORK IN THE DRUG STORE?

ROSA UPSON, M. D.

At first glance, the question upon which I am asked to express my opinion would impress every thinking, educated pharmacist as decidedly a gain and an improvement over the old method of taking apprentices on trial. Seriously considered, Would it be *either* a loss or gain?

The plea for higher education in all walks of life, all professions, all branches of business industry, is becoming universal, and is to be commended. There is always a need to plead for a better education in *any* profession, in any trade, any calling, no matter how lowly. No one can for a moment doubt that a better educated class of tradesmen, artisans, and laborers would materially increase our resources and mitigate many hardships.

Pharmacy is a science, and a far-reaching one. It overlaps the kindred sciences of botany, chemistry, medicine and philosophy. A true pharmacist must be fully imbued with a professional spirit, and to do this he must possess a general education equal to that of any other man, be he theologian or scientist.

The life of every human being is at some time during its existence placed in the hands of physician or pharmacist, or both. It often takes but one mistaken dose to bridge the River which separates us from the great Beyond. This being true, how necessary it is that every person who would enter a profession of such great responsibility, should be clear-headed, quick-witted, and capable of absorbing the plain every-day minutiæ of an English education before attempting the intricacies of scientific pharmacy.

There can be no better time for me to plead for higher education than the present, when representatives from all the nations of the earth are gathered together to witness the gigantic strides civilization has made within our borders, and to investigate the free institutions of this great and grand Republic, foremost among them our Public School system.

With the advantages offered in this country, I claim that no man or woman who has the ambition to become a professional person, has a *right* to present himself to us for a position of such great importance, if he has so far forgotten his American pride as to have neglected that which makes the man and afterward the money—a common school education.

While it could be no loss to the pharmacist to compel the applicant to pass an examination before the Board of Pharmacy, it is a question whether or not it would be a gain. Were the Boards of Pharmacy in the various States occupying that position by reason of fitness, instead of be-

ing appointed as many of them are by the Governor, with political influence many times solely the basis of appointment, I might look upon it in a different light, and as one move in the right direction; but it is a lamentable fact that there are many pharmacists acting on Boards of Pharmacy to-day, whose education, outside of the practice of pharmacy, with a slight smattering of the theory, is very meagre.

I remember once sitting at a hotel table in company with a Commissioner of Pharmacy and several other gentlemen, when one of them in conversation made use of a common Latin phrase. The Commissioner, not understanding the expression, could not appreciate the laugh that went round, and asked me what it meant. I expressed my surprise that a Commissioner of Pharmacy should not understand so common a Latin quotation, when he remarked that he "did not know the meaning of a single Latin phrase or termination, and saw no use for them anyway."

To me, the farce of an intelligent young man or woman going before such a man to pass an examination as to their educational fitness to enter upon the duties of a drug clerk, seems like child's play.

Each pharmacist should be sufficiently well educated to be able to give this examination himself, and by so doing have the double advantage of judging something of the disposition, deportment and characteristics of his victim. The manner of reply to questions often shows more of the depth of knowledge than the language used, and I believe every pharmacist should constitute himself a committee of one, to pass upon the merits of his would-be employee.

The drug trade is an exacting one, and the druggist often has his patience tried, and must continually watch his self-control. His own welfare demands that he control his temper under trying ordeals, and present to his customer and the world the polish and culture of the gentleman.

In legislation there is a panacea for many pharmaceutical ills, but until States make laws whereby members of the Board of Pharmacy shall be chosen for their fitness, the standard of educational qualifications will not be materially increased. When only educated pharmacists are allowed to be members of Boards of Pharmacy, irrespective of politics and a long list of wire-pulling backers, only educated men and women will conduct our pharmacies, and only people with an educational foundation will apply for positions as drug clerks, when the goal can only be reached by hard and persistent brain work, as well as manual labor.

Then, there will be no need of this preliminary examination, because all this will be provided for in the public schools.

MORE CHEMISTRY NEEDED—A PLEA FOR THE EXTENSION OF THIS BRANCH OF A PHARMACIST'S TRAINING.

BY ALFRED R. L. DOHME, A. B., PH. D.

"Keep abreast of the times," is the cry on all sides and everywhere in this last decade of the nineteenth century. Any person who fails to follow the teachings of this popular edict, be it in science or business of any nature, soon becomes a back number, and is regarded more or less as a fossil. It is the age of advancement and of progress, and to be successful a man must advance and progress with the age. Science is advancing with giant strides; veritable revolutions are taking place in all branches of it, notably chemistry, and unless a man follows closely the work that is being done he soon finds himself in a bog where he sees confusion on all sides and no landmark or guidepost in sight. Pharmacy is advancing, and the advance is along the line of the chemical cohorts; chemistry is encroaching upon her parent science, and threatens to make a serious fight for supremacy in the eyes of both physician and pharmacist. It is not much of an exaggeration to say that the percentage of prescriptions written by physicians and filled by pharmacists that embody in them chemicals pure and simple, though very far from simple in their constitution, is increasing in arithmetical progression. Every day almost sees a new organic compound or mixture of organic compounds ushered into existence, and just as truly does every day see an increase of them in number on the prescription files of the pharmacist. It is no longer only quinine, strychnine, morphine, cocaine, antipyrin and other alkaloids, besides inorganic chemicals, that greet him; no—the names have increased both in number, length and complexity, as piperazine, diethyl-sulfon-dimethyl methane, chloralamide, phenyl-dihydro-quinazoline-hydrochloride, phenylacetamide, di-isobutyl-orthocresol iodide, etc., evidence. Where is the true cause of this innovation in the pharmacist's curriculum to be found? Advance of knowledge and improvement of scientific methods, as well as the development of pharmacology as a distinct science, are the true causes. Pharmacology studies the effect of known substances, preferably chemical individuals, upon the various organs and tissues of the animal body. Its aim is to make medicine an exact science, as nearly so at any rate as that is possible, and in order to do so it proposes to employ exact scientific methods and exact scientific material, *i. e.* pure chemical substances. It would be quite a complicated and hopeless problem from a scientific standpoint to attempt for instance to study the pharmacology of fluid extract of opium, because there are so many substances at work all at once producing the observed effect of the administration of a dose of this medicine that it is absolutely impossible to tell positively what has caused the same. When, however, one substance of known purity and composition, and if possible known constitution, is administered and certain effects are produced, we have in

hand a problem the premises of which are known tangible facts, and we can draw definite and valuable conclusions. The branch of chemistry known as the Chemistry of the Carbon Compounds or organic chemistry is an unlimited one according to the chemical laws and theories obtaining to-day, and is multiplying and increasing at a marvelous rate. One has but to cast a glance at the latest, newest trench in the breastwork of chemical journals of to-day to see what an enormous amount of work is being done in the line of producing new compounds. In every instance almost the constitution of the new comer is determined, so that our family is fully named, analyzed, examined and described structurally, physically and chemically. More than that, it is now getting to be general to describe the new compounds pharmocologically by testing their effect upon animals and human beings. Two factors have brought about this result, viz: the probability of the compounds being of value first medicinally and second financially; the chemist being no exception to the rule in most cases, and joining in the universal race for rhino. The past shows only too well what a chance discovery in this branch of a chemist's work may be worth to him, and in more ways than one. The natural result of this voluminous rush into existence of new compounds is that some day, perhaps not far off, there will be known a chemical substance possessing a definite composition, definite properties and a definite name for every known disease. The physician will of course have to be instructed fully as to the composition, dose, properties, names, etc., of the compounds, and what is true of the needs of the apothecary in this line is also true of him. That the pharmacist and the physician should in future be more thoroughly and extensively versed in organic chemistry than they are at present, is, we think, very evident. Does it not seem very evident to every teacher of chemistry in our colleges of pharmacy, to every studious and scientific pharmacist, and to the State Boards of Pharmacy the country over, that it is incumbent upon them to meet this exigency and take the bull by the horns by increasing the amount of time spent on organic chemistry, by instituting experimental work in the laboratory and drug store in organic chemistry, and by becoming as thoroughly acquainted with the properties, composition, etc. of antipyrin, phenacetine, etc., as they are with those of epsom salts, potassium chlorate, etc., even if the terms and courses of study at college have to be lengthened?

If the State were made aware of the fact that men were handling daily, and in unlimited quantities, medicaments of which they knew nothing save their names perhaps, and possessed not the means of acquainting themselves with anything further about the substance, it seems very probable that it would be the State's duty to interfere and adopt stringent laws on the subject. That this is not necessary at present is also clear, because we are only on the veritable threshold of what is to come—of the time when these so called "new remedies" will number not dozens or hundreds, but

thousands perhaps. It is a very serious matter and an irrepressible conflict, because no observant pharmacist or chemist can deny the certain and steady increase of these "new remedies," nor the evident preference of pure crystalline compounds to extracts and composite mixtures. In the writer's opinion the pharmacist of five years hence will have to be as well acquainted with the intricacies and beauties of organic chemistry as he is now with those of inorganic chemistry. Whether or not the United States Pharmacopœia will make any or all of the "new remedies" official, is a question that cannot be answered at present, but does not much affect the problem under consideration, for the said remedies will be prescribed and dispensed in either case, very few if any men in all probability refusing to prescribe remedies that are known to be uniformly reliable and efficacious, simply because some firm or another has the exclusive right to manufacture and sell them. This would be pedantry. When they do come "en masse" and are generally used, will not the teacher of chemistry feel that he is not educating his pupils, if the present system continues, and will not the pharmacist feel that his calling is getting a little the better of him?

To give an adequate idea of what has been done in this line of so called "New Remedies," the following list of these compounds has been compiled:

Name.	Synonyms.	Formula.
Acetanilid	Phenylacetamide	$C_6H_5.NH.CO.CH_3$.
Amylene Hydrate	Dimethyl-ethyl-carbinol	$\begin{matrix}CH_3\\CH_3\end{matrix}>C<\begin{matrix}C_2H_5.\\OH.\end{matrix}$
Anthrarobin	Desoxy-alizarin	$C_6H_4<\begin{matrix}C(OH)\\CH\end{matrix}>C_6H_2(OH)_2$.
Antipyrin	Dimethyl-phenyl-pyrazolon, analgesine, phenazone, etc.	$(C_6H_5)N<\begin{matrix}CO—CH.\\\|\!\|\\N—C.CH_3.\end{matrix}$ (CH_3)
Aristol	Dithymol-diiodide	$\begin{matrix}C_3H_7\\CH_3\end{matrix}>C_6H_2(OI)C-C(IO)H_2C_6<\begin{matrix}C_3H_7\\CH_3.\end{matrix}$
Benzanilid	Phenyl-benzamide	$C_6H_5.NH.CO.C_6H_5$.
Benzonaphtol		$C_{10}H_7O.OCC_6H_5$.
Benzosol	Benzoyl-guaiacol	$C_6H_4(OCH_3).O.CO.C_6H_5$.
Betol	Naphtalol, naphtosalol, etc.	$C_6H_4<\begin{matrix}OH.\\COOC_{10}H_7.\end{matrix}$
Bromoform	Tribrom-methane	$CH.Br_3$.
Bromol	Tribrom-phenol	$C_6H_2Br_3.OH$.
Chloralamide	Chloral-formamide	$CCl_3CH.OH.CO.NH_2$.
Chloralimid		$CCl_3CH.NH$.
Chloracetone		$CH_3.CO.CH_2Cl$.
Cresol-iodide	Isobutyl-phenol iodide	Formula not given.
Cresalol	Cresol salicylate	$C_6H_4<\begin{matrix}OH.\\COOC_6H_4.CH_3.\end{matrix}$
Cresotic Acid	Homo-salicylic or oxytoluic acid	$C_6H_3\begin{matrix}—OH.\\\end{matrix}\begin{matrix}/CH_3.\\\backslash COOH.\end{matrix}$
Diaphtherin	Oxy-quinaseptol	$C_6H_4<\begin{matrix}C(OH)—N.C_9H_6(OH).\\C(SO_3H)—N.C_9H_6(OH).\end{matrix}$

Name.	Synonyms.	Formula.
Dithiosalicylic Acid.	Di-β-thiooxybenzoic acid.	$S.C_6H_3<\begin{matrix}OH.\\COOH.\end{matrix}$ $S.C_6H_3<\begin{matrix}COOH.\\OH.\end{matrix}$
Diuretin	Sodio-theobromin-salicylate	$C_7H_7NaN_4O_2 + C_6H_4<\begin{matrix}OH.\\COONa.\end{matrix}$
Dulcin	Para-ethoxy-phenyl-urea.	$CO<\begin{matrix}NH_2.\\NH—C_6H_4.OC_2H_5\ (p).\end{matrix}$
Ethyl-bromide	Monobromethane	$C_2H_5Br.$
Eugenol Acetamid		$C_6H_3<\begin{matrix}C_3H_5.\\OCH_3.\\OCH_2.CONH_2.\end{matrix}$
Euphorin	Di-isobutyl-ortho-cresol-iodide	$\left(\begin{matrix}C_4H_9\\CH_3\end{matrix}>C_6H_3O\right)_2 HI.$
Europhin	Phenyl-urethane	$C_6H_5.NH.CO.OC_2H_5.$
Exalgine	Methyl-acetanilid	$C_6H_5.N(CH_3).COCH_3.$
Gallacetophenone		$CH_3.CO.C_6H_2(OH)_3.$
Guaiacol	Methyl-pyrocatechin	$C_6H_4<\begin{matrix}OCH_3.\\OH.\end{matrix}$
Hydracetine	Acetyl-phenyl-hydrazine	$C_6H_5HN.NH.COCH_3.$
Hydroxylamine hydrochloride		$OH.NH_2.HCl.$
Hypnone	Methyl-phenyl-ketone	$CH_3.CO.C_6H_5.$
Hypnal	Compound of Antipyrin and Chloral	Formula not given.
Ichthyol	Ammonium Ichthyol-sulphonate	$C_{25}H_{36}S_3O_6(NH_4)_2.$
Iodol	Tetra-iod-pyrrol	$C_4I_4.NH.$
Iodopyrine	Mono-iodo-antipyrin	$(C_6H_4I).N<\begin{matrix}CO——CH.\\\|\\N(CH_3)—C(CH_3).\end{matrix}$
Methacetine	Para-methoxy-acetanilid	$C_6H_4.(OCH_3).NH.COCH_3.$
Methylal	Methylene-dimethyl-ether	$CH_2.(OCH_3)_2.$
Methylene Blue	Tetra-methyl-thionin-chloride	$N<\begin{matrix}C_6H_3—N(CH_3)_2.\\\|\\C_6H_3\end{matrix}>S.N(CH_3)_2.Cl.$
Methylene Chloride	Dichlor-methane	$CH_2.Cl_2.$
Beta-Naphtol		$C_{10}H_7(OH)\ (\beta.)$
Losophane	Tri-iodo-meta-cresol	$C_6H—OH.\begin{matrix}CH_3.\\I_3.\end{matrix}$
Orexine hydrochloride	Phenyl-dihydro-quinazoline-hydrochloride	$C_6H_4<\begin{matrix}CH_2.N.\\\|\\N—CH.C_6H_5HCl.\end{matrix}$
Pental	Trimethyl-ethylene	$(CH_3)_2C.CH.CH_3.$
Phenacetine	Para-acet phenetidine or para-ethoxy-acetanilid.	$C_6H_4<\begin{matrix}OC_2H_5\ (p).\\NH.COCH_3.\end{matrix}$
Phenocoll hydrochloride		$C_6H_4<\begin{matrix}OC_2H_5.\\NH.COCH_2.NH_2.HCl.\end{matrix}$
Piperazine	Di-ethylene-diamine	$C_2H_4<\begin{matrix}NH\\NH\end{matrix}>C_2H_4.$
Saccharin	Benzoic sulphinide	$C_6H_4<\begin{matrix}CO\\SO_2\end{matrix}>NH.$
Salipyrin	Antipyrin-salicylate.	Formula not given.
Salol	Phenyl Salicylate	$C_6H_4<\begin{matrix}OH.\\COOC_6H_5.\end{matrix}$
Sozoiodol	Di-iodo-paraphenol sulphonic acid	$C_6H_2.I_2.OH.SO_2OH.$
Sulfaminol	Thioxy-diphenylamine.	
Sulfonal	Di-ethyl-sulfon-dimethyl-methane	$\begin{matrix}CH_3\\CH_3\end{matrix}>C<\begin{matrix}SO_2C_2H_5.\\SO_2C_2H_5.\end{matrix}$
Sozal	Aluminium-para-phenol-sulphonate	$(C_6H_4(OH).SO_3)_6Al_2.$

Name.	Synonyms.	Formula.
Thalline	Tetra-hydro-para-quinanisol	$C_9H_{10}N.(OCH_3)$.
Thiosalicylic Acid		$C_6H_4<\begin{matrix}SH.\\COOH.\end{matrix}$
Thiosinamine		$CS<\begin{matrix}NH_2\\NH_2.\end{matrix}—C_3H_5.$
Tetra-thio-dichlor-di-Salicylic Acid		$S_4\ C_6H\begin{matrix}\diagup Cl.\\—OH.\\\diagdown COOH.\end{matrix}$ $S_2\ C_6H\begin{matrix}\diagup COOH.\\—OH.\\\diagdown Cl.\end{matrix}$
Tolypyrin	Methyl-antipyrin.	
	Methyl-antipyrin	$C_6H_4(CH_3)N<\begin{matrix}CO——CH\\\\N——C(CH_3).\\CH_3\end{matrix}$
Urethane	Ethyl-urethane	$CO<\begin{matrix}NH_2.\\OC_2H_5.\end{matrix}$

BALTIMORE, *June 3, 1893.*

QUERY 7.—SHOULD ANY CANDIDATE BE PERMITTED TO GRADUATE IN PHARMACY BEFORE HE IS ABLE TO APPLY THE TESTS AND ASSAYS OF THE UNITED STATES PHARMACOPŒIA?

BY DR. WM. SIMON.

It is by special request of the chairman of this section that I answer this query.

At the outset I will say that there is no doubt in my own mind that this query should be answered otherwise than by a most positive "No."

The United States Pharmacopœia is recognized as authority, and, in fact, is the only official authority which determines the nature, strength and purity of drugs and medicines. The Pharmacopœia is supposed to be in the hands of every physician and of every pharmacist, though each profession derives from it knowledge which it utilizes in somewhat different directions.

The physician needs the Pharmacopœia in order to be familiar with the constituents of the various preparations and with the amount of active principles contained in them, so as to prescribe them properly. The physician takes it for granted that any of his prescriptions, as long as they contain no other but medicinal agents mentioned in the Pharmacopœia, will be filled by the pharmacist with exactly that article, or those articles, as mentioned and described in the official guide-book. In other words, the physician throws the whole responsibility for the quality of the medicines upon the pharmacist. This explains why the latter has to make another and even more extended use of the Pharmacopœia, by following closely the various methods laid down for making the different preparations or for determining their nature and purity.

How is it possible for a pharmacist to be responsible for the quality of his drugs and medicines, otherwise than by either preparing them, or by examining them himself? I may be answered that many manufacturers are but too willing to relieve the pharmacist of this responsibility, and to furnish him the preparations with a guarantee for strength and purity.

But is the pharmacist justified in permitting this responsibility to be taken off his hands? What has the physician to say to this; how will the public at large look upon such a change; and finally, what view will the State Laws take in this matter? These are the questions which have to be considered before the query under consideration can be properly answered.

There is no doubt that the druggist has been, and is, looked upon to-day by the physician, the public and the law, as the party responsible for the quality of the official drugs and preparations which he dispenses. As soon as he throws this responsibility upon somebody else, he no longer deserves the name pharmacist. He becomes the vender of articles of which he need not know much, if anything. He might yet require some little knowledge of the "Art" of pharmacy, but the "Science" of pharmacy would become unnecessary for the mere vender of medicines.

Even more seriously affected would be the position which the pharmacist occupies in his relation to the physician and the public. One of the most characteristic and distinguishing features between pharmacists and tradesmen is this: The value of articles sold by the tradesmen can be judged in most cases by the buyer just as well as by the seller. In medicines this is generally an impossibility, not only for the public at large, but even for the physician. They both depend not only upon the absolute integrity of the pharmacist, but also upon his personal knowledge regarding the nature of the goods he sells.

The pharmacist consequently holds a trust, and it should be a sacred one to him, because his fellow beings entrust into his hands their most valuable possessions: health and life. And surely the pharmacist cannot afford to neglect any of his duties and responsibilities which have a bearing upon his trust.

The law also recognizes this fact, and would never allow the druggist to throw this responsibility upon somebody else, *i. e.* upon a wholesale house or a manufacturer. If it should be demonstrated in court that the health of a person had suffered in consequence of a medicine not having been of the kind and quality prescribed by the U. S. P., no judge or jury would permit the dispensing druggist to escape punishment for the reason that he claimed ignorance as to the quality of the article sold.

In order that I may not be misunderstood, I will state that I freely admit that many manufacturers of chemicals or pharmaceutical preparations have not only better means for manufacturing them, but may be more skilled in testing and examining them, than many pharmacists. But these manufacturers themselves will no doubt agree with me when I say that the

responsibility for the quality of the preparations should not be taken from the pharmacist. The reason is obvious, because, as soon as this were done, there would spring up a number of unscrupulous dealers and manufacturers selling, or trying to sell, to the druggist articles of inferior quality. Consequently, even our honest manufacturers have to admit that the existence of well educated, responsible pharmacists is a necessity, as the uneducated, irresponsible druggist soon would sell inferior articles and imitations.

These are the reasons why the educated, skillful, competent pharmacist is a necessity. Even if he does not manufacture as many preparations now-a-days as he did formerly, he surely should be fully competent to test critically those which he buys. He either must do this, or he will misuse the confidence placed in him by the physician and the public, and will violate the State laws which compel him to dispense medicines of the standard recognized by the Pharmacopœia.

Having thus demonstrated that and why the pharmacist should be able and competent to apply the tests and assays of the U. S. P., it follows that the candidate for graduation in pharmacy must be expected to be familiar with this work. The diploma of Graduate in Pharmacy is a document certifying that the owner of it is a competent pharmacist, and he does not deserve that title unless he can use the U. S. P. fully and intelligently in all its bearings. This of course includes the knowledge of applying the tests and assays mentioned in the Pharmacopoeia.

While the query does not *directly* imply an expression regarding the *feasibility* of the candidate acquiring the knowledge under consideration, I take the liberty of adding a few words in this direction.

My long experience as teacher and instructor of classes in the laboratory has taught me that there is a perfect willingness and even an eagerness on the part of the great majority of students to learn all that can possibly be learned in the courses of instruction given. In other words, whenever new opportunities are offered to the student to acquire knowledge which is useful in his calling and necessary for graduation, he gladly avails himself of these opportunities. Repeatedly the standard for graduation has been raised in the pharmaceutical colleges, and the same has to be done, and will be done, in the future whenever necessity arises.

Each succeeding Pharmacopœia introduces more exact, more elaborate, more rigid methods for the examination of most chemicals. These methods require greater skill and better knowledge, and the colleges are justly expected to educate and train their students so as to satisfy the demand for this more exact work.

This is not the time to speak of the methods to be used by the colleges for teaching the student. My object was only to emphasize the fact that it is their duty to teach the application of the tests and assays of the U. S. P., and not to graduate students before they can apply these tests properly.

Baltimore, July, 1893.

A paper contributed by Chas. M. Troppmann, entitled "Danger of our Prescription Business," was, on motion, referred to the Section on Commercial Interests.

The committee appointed at the first session to consider Mr. Hallberg's resolution regarding the requirements for graduation by pharmaceutical students, reported as follows:

Your committee find the subject such a one that it requires not only long consideration, but extensive correspondence with gentlemen who are not present at this meeting, and therefore ask to be allowed to report at the meeting of this Section next year. The committee desires very much that, during the coming year, gentlemen associated with the various colleges throughout the country will interest themselves in the subject and send to any member of the committee a statement in regard to the position of their colleges, or any other facts connected with the question. Such action will be greatly appreciated.

On motion of Mr. Whitney, the report was adopted.

THE CHAIRMAN: Mr. Ebert desires to address the Section on the subject of pharmacy laws. We shall be pleased to hear his remarks.

MR. EBERT: It is my desire, at this time, to say a few words on the subject of pharmacy laws, that may possibly set some of us thinking, and perhaps lead to the modification of some of the existing pharmacy laws, thereby benefiting the practicing pharmacist, who needs some relief from the present laws regulating pharmacy in the various States of the Union.

I had intended contributing a paper on this subject, having been requested to do so by the Chairman of this Section, but was prevented by lack of time. I will, therefore, state briefly my ideas on pharmacy laws as they should exist and as they do exist in this country.

You may perhaps remember that at the meeting of this Association in Chicago in 1869, the first draft or skeleton draft of a proposed pharmacy law was presented by a committee which had been appointed by the Association the previous year. That committee consisted of the President, ex-President and the Permanent Secretary of this Association. I wish to state briefly why such a draft of a law was presented at this time. Shortly after the close of the war, a number of serious mistakes occurred in the dispensing and sale of drugs and medicines in this country, and the newspapers were filled with sensational accounts of this horrible butchery of the people by the incompetent druggist. The newspapers demanded that State legislatures should pass laws for the better regulation of the drug business. The American Pharmaceutical Association felt that it would be wise, if legislation were to be commenced, to have the laws based on some uniform plan, and therefore appointed a committee to consider this matter. This committee introduced the draft law to which I have referred. When it was submitted to the Association, many of our foremost leaders like Colcord, Procter, Parrish, Squibb and others, while they approved of the draft and its objects, opposed its adoption with a view to urging legislation unless it was found necessary in order to prevent improper laws being passed. Their advice, however, was not heeded; and the draft was referred for publication. No sooner did this proposed law appear in print than the druggists of the different States vied with each other to burden themselves with pharmacy legislation. The result has been that in the lapse of a quarter of a century since the question was first proposed we have had legislation for the regulation of pharmacy in nearly every State and Territory of this country. What good, if any, has legislation been to the pharmacist who is in business on his own account? Has it not had the effect of multiplying the number of drug stores

in every State and Territory where pharmacy laws exist? I will make this broad statement, that it has multiplied drug stores faster than in England, for wherever a pharmacy law has been enacted, the effect of it has been to start up drug stores, because, as we were so well informed this morning by those who spoke, the examinations of Boards of Pharmacy are, generally speaking, farces—and I say they are a farce. There should be laws to regulate the practice of pharmacy without any doubt in my mind, but these laws should be of such a character that while they protect the public, in whose interest they have been enacted, they should also, in some way, benefit the druggist.

The claim was made at the inception of the laws in the various States that as the law could not legislate any one out of business at the time the law went into effect, there would therefore remain many incompetents in the business, and to better protect the public it was considered necessary that an assistant or clerk should be competent. It was arranged that after the passage of the law each and every one, whether owner or manager, clerk or assistant, should be examined by a Board of Examiners, to determine the qualifications of the applicant for registration. Now, the examinations conducted by a Board of Pharmacy, as a rule, are a farce; for it is impossible to determine with any degree of accuracy the qualifications of those who apply for registration by examination, unless it is at a time when the Board has only two or three applicants to examine. In the time usually devoted to these examinations it is an impossibility to learn more of the qualifications of applicants than the mere ability to answer a number of questions which, as a whole, are easily mastered.

Now, as pharmacy laws have existed in most States from five or ten to fifteen years, the time has arrived when a change should be made, providing that the only person eligible for examination by the State Boards shall be a pharmacist engaged in business on his own account, or one who wishes to become the manager of a drug store or pharmacy. To the proprietor or manager should be assigned the responsibility of judging the qualifications of his assistants. This will allow the Boards of Pharmacy the necessary time to investigate the real qualifications of such few applicants as desire either to go into business or become managers of businesses. To these applicants the question of cost or the length of time consumed in an examination should not be an object. They cannot claim, as the clerk or assistant does, that it is a hardship either in money or time, to undergo such an examination. If the judging of the qualifications possessed by the clerk or assistant were left to the proprietor or manager, then it would not, as it is now, make a candidate of the young man who has had barely two or three years' experience, and permit him to embark in the drug business on his own account. In this way, the stores would become limited in number, and the competition suffered by those who are in business (and defray the expenses of enforcing the law) would be lessened to some extent. I certainly believe that those who are in business, and who are giving the public the benefit of long years of service, should receive some adequate compensation, if in no other way than that those who are in competition with them should be equally competent in both theory and practice, so that the competition may be a fair one and permit the earning of a livelihood.

MR. WHITNEY: I shouldn't think of occupying a single moment of the brief time now remaining for the business of this Section, were it not for the fact that the speaker has made a statement to the effect that the Boards of Pharmacy examinations are a farce. We have heard this statement after having listened to the remarks made at the banquet last evening, to the words of welcome, and to speakers who stated that Chicago is so near heaven that there is no place on earth so nearly perfect, and no place in this wide world, above or below, that does things so well as Chicago. Now, sir, I should not have attempted to comment upon the address we have just listened to had it not been for the fling at my poor little State in which the speaker indulged. It is true that our State is

modest and retiring; but it seems too bad that one of our representative men here should say that the result of all this work is a farce. Now I will tell you what we do in Massachusetts. Our legislature has provided that no one shall be placed on a Board of Pharmacy who had not less than ten years' practical experience either in another's employ or on his own account. We are not allowed to have any assistant pharmacists; they must be full-fledged before they can be registered. Mr. Ebert stated that 15 or 16 per cent. pass here in Chicago. I can recall two meetings in our State where thirty-one were examined and not one passed.

Mr. Ebert: I would ask Mr. Whitney whether I referred to Massachusetts in my remarks about Boards of Pharmacy examinations. I must say that I had no more idea of referring to Massachusetts than I had to Nebraska.

Mr. Whitney: I am sorry if Massachusetts is to be considered an outside State. I should have thought that Massachusetts would have been included. I am sorry to say that I am not a graduate of a college of pharmacy, but, gentlemen, I am simply telling the truth when I say that a graduate of a college of pharmacy has often been before our Board two, three, four, five or more times, and has failed to score even 50 at his examinations. Now, to be told that Board examinations are mere farces is an outrage, and I protest against it. If the gentleman who has spoken did not include Massachusetts, as he now says, I am willing to keep still.

Mr. Alpers: I come from New Jersey, but I am afraid I may be told that New Jersey is outside of Illinois. As a member of the Board of Pharmacy of New Jersey, however, I cannot allow such remarks as have just been made to pass without protesting against them. I wish to assert most emphatically that the examinations of our Board are not farces, and never will be. I know well enough that great pressure is sometimes brought to bear on members of the Board of Pharmacy in the way of bribes or threats, and I can relate one incident of this which may be of interest. Last winter, a man came into my store, introduced himself as Dr. So-and-so, member of the Legislature—a senator, I believe. He then inquired, "What is the matter with John So-and-so?" "Well, who is he?" I asked. "Why, a young man who has been before your Board several times and failed each time," replied the doctor. "Then," said I, "probably he didn't have the necessary qualifications." This answer did not please my visitor, and he promptly retorted, "My dear sir, I'll tell you what it is: if that young man doesn't pass your Board the next time he comes before it for examination, we will have the pharmacy law repealed and kick out the whole lot of you." "Well," I said, "my dear sir, if your candidate has only as much knowledge of pharmacy as you have described, he will not pass." The candidate did not pass the next time, but the law has not been repealed.

I can tell you, Mr. Chairman, that a man of honor recognizes only one principle on a Board of Pharmacy. He does his duty, and does not care for his fate. Therefore, if any man says the examinations of the Board of Pharmacy of New Jersey are farces, I tell him that he does not know what he is talking about.

Mr. Ebert also told us that the proper way to register is to register only the owners of stores and not their assistants, and that the owners of stores should be the only judges of a candidate's qualifications. I ask, Mr. Chairman, whether this is not practically what is done now? It is so, at least in our State, where the Board of Pharmacy is composed of only the owners of stores; for every member of the Board must be a practical pharmacist doing business in the State. We have no Doctors of Medicine on our Board, no theorists, no patent medicine men, but only practical pharmacists actually engaged in business. Last year, we had a case where a man had to resign because he went out of business, although he was a member.

MR. EBERT: I certainly did not intend in anything that I said to insinuate that members of Boards were sometimes registered as assistants or clerks. I said, I believe, that owners of stores are the only proper men to be registered by Boards.

MR. ALPERS: Why should not an assistant have the same privilege as the owner? If the owner of a store attends the meetings of the American Pharmaceutical Association, who is he going to put in charge of his establishment if not a qualified assistant? If the assistant is not qualified, with what degree of satisfaction can a man leave his store? Mr. Ebert has also objected to young men becoming his competitors after passing the Board. This is certainly the case in every business throughout the country, and it is only a natural condition of our social system. Probably Mr. Ebert in his younger days became competitor of some one else, on the next corner, when he started in business; so did I, so did everybody else, and so will the young men who come after us. That is the way the world goes, and no legislation can stop it.

MR. WHELPLEY: Evidently the young men who fail to pass examinations in New Jersey are not so persistent as those plucked in Missouri. At a recent examination in our State a young man wrote in red ink at the bottom of his paper, underlined, "This is my fourth examination. Where does the Board meet next year?"

MR. ROGERS: I represent the land of beautiful women, fast horses and good whiskey, and I wish to enter my protest also. I believe I am the only member of the Kentucky State Board present at this meeting. I desire to say that our records show that at least 50 per cent. of the candidates fail at their first examinattons, while at the second examination 25 per cent. fail. Where the other 25 per cent. go to I don't know, but they never re-appear.

MR. VERNOR: How many examinations, outside of his own Board, has Mr. Ebert ever attended?

MR. EBERT: I have attended only the State examinations of Illinois, although I have frequently been in other States when examinations have been held.

MR. VERNOR: Then your experieence applies exclusively to the time you were on your Board.

MR. WHITNEY: Perhaps Mr. Ebert is not aware that we get $5 for the first examination. The law provides that we must examine all who present themselves, and that they may take as many examinations as they choose, but candidates are required to pay only $3 on the second, or up to the twentieth examination, if they desire to try that number. We have had one man appear before us sixteen times, and every time he has failed to pass the examination. We charged him three dollars each time. We don't do things in a small way in Massachusetts. Some of the young men seem to be very much pleased with the opportunities afforded them of attending these examinations, and the remark is frequently heard, "Well, I am going up to take a three dollar lesson. I get more for my money out of them than anywhere else."

MR. HALLBERG: That is where the farce comes in—that very remark. The question, I admit, is a hard one to deal with, and the term "farce" is probably too severe; but it is a fact that young men travel around in the various States, and wherever there is a meeting of a Board of Pharmacy they will attend its examinations if they have the wherewithal, and they will follow up these examinations until finally they get some Board on the hip and they pass. The average young man with two or three years' experience in four or five different drug stores, by investing a few dollars in quiz compends and watching the

journals for the publication of questions, finds it a comparatively easy matter to pass a Board of Pharmacy examination at the third or at most the fifth time. It does not involve any particular fundamental principle or knowledge on his part to pass the average Board of Pharmacy. Of course, if in addition to the theoretical questions the examination also requires the qualification of practical dispensing, then it involves a more thorough practical knowledge on the part of the applicant. Therefore, while I do not approve of the terse remark made by Mr. Ebert, still I believe his statement, on general principles, is correct. Of course, members of the different Boards of Pharmacy naturally desire to uphold the dignity of their Boards, but the experience of those who have had the opportunity to not only judge one Board, but a number of Boards, and who, if I may say so, have even against their will been compelled to furnish members of the different Boards with the questions for examination—their experience has clearly demonstrated, for several years past, that a great many Board examinations should not be entitled to recognition as indicating the status of a man's pharmaceutical knowledge when passed. But how to remedy this is a very difficult matter, and one which I should not feel like attempting at this time.

Mr. Dadd: I have listened to these remarks with a great deal of interest, because I took an active part in bringing about the enactment of one of the earliest pharmacy laws, and have always advocated such laws. It seems to me that there has been a misconception of the whole subject by most people. This is a question of evolution and relates to an improvement upon the condition of things in the past. I make that assertion and stand on as broad a basis as any one. I have been connected with pharmacy for many years, and I know from being on the first Board of Pharmacy that was ever established in Wisconsin, what a vast improvement such Boards have effected in elevating the status of pharmacy. I have noticed this in the twenty years that have past since our Board was first organized. I have observed the kind of young men who have come up to be examined, and compared them with those who went into business before the Board was established, and find that they are better educated and better qualified in every way. In this connection, I would add that it is a common idea that a young man should not be registered or be permitted to enter the ranks of pharmacy unless he has been educated in a college of pharmacy, and I must say that I don't believe in this principle at all. I believe that a man should get his education where he can, and all we want are men fitted to perform the duties of pharmacists in a satisfactory manner. There are plenty of men on the Boards of Pharmacy to-day who are fully capable of judging as to whether or not candidates for registration are competent, and for this reason I consider that there is no necessity for harsh criticism of those Boards.

Mr. Torbert: I yield to no man in this Association in the extent of personal regard for Mr. Ebert and respect for the sentiments he generally expresses on any subject, but it occurred to me as I listened to him that his words would lead one to believe that he is a man whose sands of life have long run. On the contrary, I know from personal knowledge that few pharmacists when they have attained his years and experience are such hustlers as he is, and I don't think that the young men have gotten the advantage of him at any point.

The other day, I read that a man in sending an application for office to President Cleveland, or some other member of the government, closed his letter with the words, "God and Gresham are with me." Subsequently, as you may recall, at a cabinet meeting, when Secretary Gresham's attention was called to this, and he was asked what he knew about it, he said, "Wait till you hear from God, and then I'll report." Now, my thought is that the American Pharmaceutical Association is for helping the young men, and so is God, as a matter of fact. We expect these young men to come up and take our places, and they really stimulate us with energy. If the theory which my friend Ebert has pre-

sented here had been in practice when we were young men, where would this assembly of the American Pharmaceutical Association have been to-day? The simple fact of the matter is that we, through the experience that we gained while associated with the men who employed us, in earlier years, acquired a knowledge of the business and afterwards graduated in pharmacy. Now, others are becoming familiar with pharmacy through the National Formulary and in other ways, and are simply doing what my friend Alpers has suggested men are doing everywhere, and will probably always do. Why, in the city of Dubuque I have graduated seven men into competitors, four of whom are conducting establishments quite as large and successful as my own, and I hope before I die to be able to graduate a good many others. If all of them should be equally successful, I think it will reflect credit on their training. The fact of it is that this increasing number of pharmacists is generally attended with an increasing amount of business patronage, and this has been the case at Dubuque. Although my competitors have done well and succeeded, my business does not show any diminution in either receipts or profits.

The second remark I wish to make in reply to Mr. Ebert's address is, that I do not like the idea so frequently expressed in our Associations, to the effect that the pharmacists of this country are such a helpless set of beings that they must, on all occasions, be held up and bolstered by the law or laws, or they will not succeed. Why, my dear friends, if we keep on at this pace, and this sort of philosophy obtains more and more, the time will ultimately come when the State will have to pension the pharmacists, and we shall all be on the pension rolls. Now, I think that line of philosophy is all wrong. The pharmacists of this country are to-day succeeding, considering the average, better than any other class of men. You men all apear to be solid and prosperous, and not as if the young men who had graduated into competitors had interfered materially with your success. You know that this is not the case, and you know that you don't need any such class legislation in your interest as we have proposed to-day. If you cannot conduct your pharmacies by your brains, by your familiarity with your business, then step down and out, and let others in, who do not need such legislation and such bracing up as this sort of philosophy suggests.

Mr. Bodemann read the following paper:

CHANGE THE LAWS.

BY W. BODEMANN.

A few years since, I brought an ounce of antipyrin from Germany. Subsequently, during correspondence with the "sole lessee" (!) of the drug, I was dumfounded by the information that I had no right to either sell, give away, or prescribe for myself the antipyrin I had brought from abroad.

After such information, I naturally looked up the law on the subject, and became speedily satisfied that according to statutory declaration I could be held legally responsible if I dared to ingest a portion of antipyrin that had not paid a royalty to the "sole lessee" of this drug for the United States.

The laws of this country are such that the name, the process of manufacture, and the finished product, are covered by patent enactment.

What is more remarkable, the founder, or discoverer, of antipyrin, could not obtain such three-fold protection in any of the effete monarchies

of Europe—he had to come to the "land of liberty," "the land of the free and the brave," where bold, grasping monopolists are at liberty to hold up the peaceful wanderer and cry, "Give me your purse—pay me a dollar for what the benighted subjects of darkest Europe pay only twenty cents."

Take sulphonal, for instance. There are four foreign manufacturers who, knowing the glorious possibilities of trademarking and patenting in the United States, came here, obtained protection on the name, product, and process of manufacture, formed a company, selected a president and agent, and then proceeded to create a demand. Note that in Germany the drug sells at twenty-five cents an ounce, and that the duty when brought to the United States is only 25 per cent. ad valorem; but, the *added protection* enables these houses to realize $1.35 per ounce.

Just so phenacetin costs thirty-three and one-third cents in Germany—one dollar here; antipyrin, seventy-three cents—but sells here for $1.40.

It occurs to me that here is an inviting field of work for the American Pharmaceutical Association. By persistent effort and unity of purpose, surely this commerce can be regulated by statutory enactment—but by-laws, resolutions and debates will never have any effect. As matters now stand, the trademark octopus constitutes absolutely a bold, legalized robbery—a form of swindling that exceeds even the crime of the foot-pad and road-agent. Surely the American Pharmaceutical Association in an effort to right this wrong could depend upon solid support from the people.

I believe foreign countries draw the line on *articles* used in the healing art, and refuse patents to those that constitute absolute remedies—at least this is true of France.

One is fairly bewildered at the mass of fraud, humbuggery, and charlatanism that has been developed in the trademark laws—*nomina odiosa sunt!*

It is not necessary to specify singly each article, except to illustrate the general argument; but if they are in consonance with their published formulæ, then any honest pharmacist could furnish such at half the price demanded. But, if the compounds resulting from such formulæ are not like the trademarked articles, either the formulæ are wrong or the proprietors do not manufacture from the formulæ as published.

Look over the field; the number of trademarked preparations is simply legion! Is it not astounding? The pharmacist is bound hand and foot—fairly tied down. He is obliged to keep the doubly and trebly protected articles, while he could better satisfy the public, and net much better returns to himself, if he were at liberty to apply his own skill!

The stupidity of the great bulk of alleged physicians is met half way by the cupidity of shrewd charlatans; thus it has become a notorious fact that any fraud, almost, can be "made to pay." Any irresponsible con-

cocter will find experimenting physicians ready to employ (if properly advertised) and then the thing is at once a success; but first, all honorable competition must be at once barred out by the monster "Trademark."

There are no legal enactments, or series of enactments, that furnish more glaring impositions than those pertaining to that same trademark. It is a notorious fact that even among so-called reputable physicians the Keeley Gold Cure met with its most credulous admirers; even Brown-Sequard challenges the gullibility of the medical public by offering his *elixirs ad longam vitam*. It makes no difference how high the source; the higher the apparent authority, the greater the charlatanry, and we have all the more reason to fervently pray to be relieved from our "eminent" or so-called "eminent" physicians, and that they shall keep their fingers out of the nostrum business; for anything and everything will find believers, and it is an everlasting disgrace to the medical education of America that trademarks find such general defence and adherents.

I have no hesitation in declaring that any physician who prescribes a remedy with the composition of which he is not familiar, is *per se* a fraud and impostor. Should a regular physician employ one of the honest out-and-out patent nostrums, even the public would call him a swindler or ignoramus. Look over the prescription file of any pharmacist, and how many prescriptions will be found that call for trademarked and secret remedies, fakes and frauds? Unfortunately, the *majority* are of this class.

I really believe if an "eminent" impostor should promulgate a story of fifteen years' research and employment of at least three living pupils of Liebig, and a couple of direct lineal descendants of Berzelius and Scheele, in his laboratory, he would find men willing to prescribe even something like *Hammondine*.

Next, let the inventor claim that the United States Army surgeons have experimented with this remedy on the plains of the wild West; let some medical journal dare dispute the value of the remedy, so as to open the path for argument in several journals; then the nostrum will at once be sold in quantities sufficient to satisfy the cravings of the would-be founders of a new factory, and speedily enable the great inventor to retire with a fortune before the falsity of the trick is found out.

One may laugh at such exaggerations, but if one-hundredth part of the attention had been paid to trademark and patent laws that has been given to the cutting and maintaining of prices, this rodent ulcer upon the body politic would not have absorbed all the best life-blood of the phaamaceutical profession, and besides usurped the greater portion of the body of materia medica.

I suggest that the American Pharmaceutical Association clasp hands with the International Pharmaceutical Convention, and endeavor to form a

congress that will return to the consideration of common sense and old-fashioned honesty, and advocate the abrogation of the objectionable features of our present patent and trademark laws.

J. T. LEE, of Cincinnati (formerly proprietor of Lee's Pills): Will you allow an old apothecary, who does not belong to the American Pharmaceutical Association, to make a statement? I have been connected with the drug business for nearly fifty years. In this country, our government protects people with patents on articles of merit, and also gives the protection of copyright. A great many preparations have been protected by trade marks; the druggists of course, buy them, and if they have the brains they will analyze them and make themselves, as a certain old friend of mine in Ohio does. When he wants antipyrine he makes antipyrine. American trademarks, I believe, hold good all over the world, except in Germany, where the government requires that the formula shall be printed on the label. In 1859, when I was a lad in Brooklyn, N. Y., I requested my employer, who was a graduate of the College of Pharmacy of New York, to allow me to join that institution, but he said "No." I always had Scotch, Irish or English clerks alongside of me to teach me how to work. Now, twenty years before the war—

MR. REMINGTON: If the privilege of the floor was accorded to the gentleman to speak on any question under discussion, I move that he be allowed to continue; but if he is not speaking on any question, I think he ought to stop.

MR. LEE: My employer, who was a thorough graduate himself, after keeping me in his store six years, would never allow me to attend a lecture on pharmacy in New York. In 1860, I had the certificates of seventy-one New York physicians to the effect that I was a competent pharmacist. So graduation, you see, does not always make a perfect apothecary.

MR. WHELPLEY: I think we should learn a lesson from these remarks, which teaches us that any young man who will continue to clerk for a pharmacist who will not permit him to attend college lectures, will eventually migrate from the pharmaceutical business into that of making pills.

MR. LEE: I have been an apothecary thirty-eight years in this country, and in 1868 the College of Pharmacy of New York was of no account.

RECIPROCAL REGISTRATION.

BY HENRY R. SLACK, M. D., PH. M., SECRETARY GEORGIA STATE BOARD OF PHARMACY.

Some time since I read an able article in "The American Druggist and Pharmaceutical Record" endorsing the action of the Colorado Board for seeking to have their law so amended as to prohibit recognition of licenses from other State Boards.

It is regarded as an axiom of history that, "revolutions never go backwards" and in politics that, "liberties once granted to the people are never surrendered without a struggle." Here, however, we have the spectacle of the exception that proves the rule, in a State Board seeking by legislative enactment, to be deprived of a liberty coveted by many of her sisters—a clause not mandatory but optional, granting permission to recognize licentiates of other Boards, and why? Because they wish to be progressive! It seems to one viewing the situation from a distance that

Colorado's entire energy is being spent in one direction—progressive and aggressive bi-metallism, or rather white-metallism.

The gentleman intimates that it is only the younger and weaker Boards that are anxious for reciprocity, and this largely because it will add dignity to them to have their licenses recognized by older and more conservative Boards. This sounds plausible, but facts will not sustain his theory. Last month I addressed a letter to the secretary of every State Board in the United States, and have reeeived answers from thirty-four, leaving only two, Utah and California, to hear from. Nineteen favor reciprocity, ten oppose, four oppose on present plan, and Ohio is divided with a majority favorable. Fourteen have already accepted the plan suggested by the Secretaries at their meeting in New Orleans. In point of age the Boards favoring reciprocity have the advantage, Georgia leading with the oldest Board, established in 1825, while Tennessee, with a law only applying to fourteen cities and a Board not yet six months old, is arrayed in opposition.

I find the average age of the twelve Boards that oppose interchange of certificates to be nine years and seven months, while that of the fourteen accepting it is nearly thirteen years. (Dates excepting Georgia's taken from Hallberg's Pharmacal Calendar).

As to lending dignity, how much would Rhode Island's recognition increase the importance of Missouri's Board or Maine's Michigan's?

"Why reciproci'y"—"tickle me and I will tickle you?" facetiously asks the writer. This question is too absurd to require an answer, and shows that while he may have some knowledge of the "*Staats-Examen*" of Germany he has small conception of state sovereignty. No civilized nation expects or demands for its citizens greater privileges or immunities in a foreign country than she is willing to grant the citizens of that state. It is only when dealing with inferior races or heathen nations that we ever have the effrontery to demand greater privileges for our citizens than we expect or promise to accord theirs; and this state of affairs has not yet been reached in these United States.

Quite a number oppose reciprocity because they think their law does not allow it. That ground is no longer tenable, as the Arkansas Board has solved that question; then, too, very few of the laws specify how the examination shall be conducted, leaving it entirely in the hands of the Board.

The Attorney-General and Supreme Court Judges of Georgia ruled that the examination of diplomas or certificates, held by the applicant, if satisfactory to the board, would satisfy that clause in the law, "Who shall have passed a satisfactory examination." This clause is in every law I have seen, and if it is a principle of law in Georgia it is a principle of law in Maine. It is on this clause that the able Board of Michigan bases its right to interchange, and. as it has stood the test of a Supreme Court de-

cision, I suppose it is correct. That being true, we can have Reciprocity of Registration if the Boards desire it.

The advantages to be gained by a system of interchange of certificates, on the plan suggested by the Secretaries' meeting at the A. P. A. in New Orleans, in my opinion far outweigh the disadvantages; though by no means perfect, it is still a long stride in the right direction.

When could a more opportune time present itself for the discussion of this subject than this, our Columbian Year, in the evening of the nineteenth century? When men from every section of the globe have met together as brothers to discuss plans for benefiting the human family, shall the honorable profession of Pharmacy reverse the wheels of progress and erect Chinese walls of exclusion along the state lines of this *E pluribus unum?*

Now as "the law allows it," let us, casting aside prejudice, formulate a plan that can be accepted by even conservative old New England, for she has far more to gain by it than we of the South and West.

Never in the history of the world has the poet's dream

"The Parliament of man, the Federation of the world"

been nearer realization than to-day in our numerous World's Congresses.

PHARMACY LEGISLATION.

BY W. W. KERR.

This subject has engaged the attention of the pharmaceutical profession for a number of years, and whilst changed in some of its aspects, is still one of unabated interest. From the beginning, the absorbing question was, "How can we best and soonest secure the protection of pharmaceutical legislation?" The result of this agitation was a boom in this direction, and one State after another fell rapidly into line, until in a short while, nearly every one had adopted a pharmacy law. One result of this —shall we say excess of zeal?—has been a great incongruity between the laws of the different States. and a want of harmony that has resolved the question into "What are we going to do with the laws we have?" As might have been expected, a revulsion of sentiment has, to some extent, ensued, which exhibits a disposition to react upon the theory of that class of legislation, and we hear occasional murmurs of dissatisfaction from high sources. While this is but human nature playing an old and well known prank, it is nevertheless, and for that very reason, not only inconsistent, but unwise. If the rule of condemning a statute because of its imperfections were to become general, our law-books would be blank pages. Some of the mutterings have floated to us in the list of queries sent out by the Secretary of the Section on Legislation and Education of this Association, with the view of eliciting the opinions of those interested, suggesting the reflections voiced in this paper.

Among these we find the "pernicious influence of politics" protecting the violators of the laws and their consequent "defiant attitude" toward them, coupled with "the lack of co-operation on the part of the people in protecting themselves against incompetency."

That these obstacles exist, and that they are formidable, goes without saying, but they lie as objections to the "pernicious influence of politics," "the defiant attitude of violators," and the indifference of the people, and not against the pharmacy laws. The same obstructions lie across the pathway of many, if not most of our statutes; but they usually act as stimulants to the improvement of the laws they obstruct, and not as arguments for their repeal; and the same rule should apply in this case, and we should be thereby nerved to greater exertions in the direction of perfecing our laws and securing their proper enforcement despite these difficulties.

This brings us into the presence of another, and perhaps a more serious obstacle, the vagaries and obtuseness of the modern law factory. It is here that the "pernicious influence of politics" gets in its most perfect work, by blinding the eyes of the legislator so that he cannot see, and dinning his ears with the thunder of the echoes from the hills of his constituency, so that he cannot hear the legitimate demands upon his calling, and thus neutralizing the efforts of the more progressive and far-seeing to secure better protection for the people against the dangers of illegitimate pharmacy. This condition of things has contributed largely towards whatever of inefficiency now exists in our pharmacy laws, and stands squarely in the way of improvement. Are we then to conclude that consequently the principle of pharmacal legislation is a failure? Certainly not. Like all wholesome laws, these are the crystallization of existing necessities; and the necessity conceded, the law must live, and the environments made to conform to the environed. What then is the remedy? *Time* and *education*. It must be remembered that pharmacy laws are of the class known as "police regulations," and, as such laws often do, wear an appearance of "class legislation"—that horror of the American people. Time and the familiarity it brings, can alone altogether dispel the illusion and beget confidence.

I apprehend that we have been disposed to hurry up matters faster than was consistent with satisfactory results. In the first place, we were too anxious to secure such legislation, and too ready to accept what legislatures were willing to give us, upon the principle that any law was better than none, depending upon securing subsequent amendments, and consequently rushing too frantically before our legislatures asking for this, that or the other alteration, until we created the impression that we did not know ourselves what we wanted; all of which, added to the proverbial characteristic of our law-making fathers to know most about that with which they were least acquainted, has resulted in the enactment of laws in the several States

which are incompatible with each other, and often not well adapted to meet the wants of their respective constituencies. All of these complications, however, only serve to make clear our duty in the premises. Accepting the situation as we find it, and profiting by our experience in the past, it only remains for us to stand squarely by the laws we have, and by their mild, but firm and impartial enforcement, so to commend them to the sober second thought of popular intelligence, that they may become an educative force which will, by its own reflex action, secure their ultimate perfection.

Having glanced hastily at the situation, the causes leading up to it, and the remedy, let us see if it may not be possible to utilize the present legislation so as to harmonize some of the existing incompatibilities.

A broad field is open here that might well engage the attention of the minds of legal bent in our profession, but it is not within the province of this paper to enter it further than to consider for a moment the question of reciprocity.

It is felt quite generally that the licentiates of one State Board ought to be regarded as competent to practice pharmacy in any other State. The laws in some States permit this, but most of them do not, and the difficulties before alluded to practically render it impossible, at the present time, to so alter the laws as to admit of it.

It is pertinent then to enquire if any scheme can be devised which will secure the advantages of reciprocity under the existing conditions.

About two years ago, the Arkansas State Board of Pharmacy, feeling the necessity for some plan by which the difficulty might be overcome, and being hampered by a law that does not recognize other certificates than its own, devised the following plan, which it is my pleasure to bring to the attention of this Section for its criticism.

"The applicant shall furnish this Board, through the Secretary of the Board from which his certificate of registration was obtained (and at his own expense), with a certified copy of the list or lists of questions which constituted the examination passed by him, together with said Secretary's certificate setting forth the rating given him on it. This information shall be filed with the Secretary of this Board, and by him laid before the Board at its first meeting thereafter, or submitted to the members thereof severally in vacation, when, if said examination shall be satisfactory to a majority of the members, a certificate shall be granted.

"The fee for this examination shall be the same as for other examinations."

The above plan is submitted as being a plain, practical, common-sense solution of the whole difficulty, which while it does not recognize the certificate held by the applicant, and is therefore not reciprocity in the ordinary acceptation of that word, nevertheless secures to him the advantages thereof, at least so far as the vexatious delay and extra expense are con-

cerned, and at the same time furnishes the Board with all the information necessary to an intelligent conclusion, and reserves to it the privilege of exercising all sound discretion.

The plan has been submitted to a number of State Boards, but under a mistaken impression that it involved their acceptance of the certificates of the Arkansas Board in return, has been endorsed by only five States. One of its chief advantages resides in the fact that it does not ask this, but only that other Boards furnish ours with the required information. Another advantage is, that it does not require organized action between the States, but may be adopted by private agreement one by one, and incurs no extra trouble upon the part of the Secretaries beyond making copies of the examination questions, for which a reasonable fee should be charged.

The reading of papers having been concluded, the next business before the Section was the election of officers.

Mr. Whelpley took the chair *pro tem.*

On motion, Mr. Whelpley was instructed to cast the ballot of the Section for the nominees selected at the morning session, namely, Dr. R. C. Eccles, Chairman and L. C. Hogan, Secretary. This having been done, they were declared duly elected.

On motion, Messrs Sayre and Torbert were appointed a committee to conduct the new officers of the Section to the platform.

MR. TORBERT: *Gentlemen:* I have the pleasure of introducing to you the Chairman of the Section for the ensuing year. He needs no introduction here or elsewhere. His standing in pharmacy is so definitely determined, and his reputation so widely known, not only in this country but across the water, that it is simply superfluous for me to try to add anything to the laurels he already wears.

MR. ECCLES: *Gentlemen:* I thank you for the honor you have conferred upon me in thus placing me in this position for a second term. During the last term I did the best I could under the circumstances, although I intended to do more than I was well able to do. I had a patent medicine man on my hands, and I had to go through the ordeals of examination for two or three days before such men as Col. Ingersoll, and had to be prepared for running the gauntlet of law. I also had sickness in my family that kept me from doing as much as I would have liked to do. During the coming year, however, I shall endeavor, if possible, to do better by you than I have in the past. I shall labor earnestly in the cause of this Section and the important interests that it represents, and trust that my efforts will not be wholly without beneficial results. I thank you, therefore, for the approval you have shown of the work I have done, which encourages me to continue with confidence in the future.

MR TORBERT: I take pleasure in introducing to you the Secretary of this Section. I can state what will strike you as almost anomalous, that although he is a resident of Chicago and is a member of the Illinois Pharmaceutical Association, he is not a farce. (Applause.)

MR. HOGAN: Members of the American Pharmaceutical Association, I had commenced to think from the way my report was received that I came very near being a farce. However, I have done the best I could under the circumstances. It is getting to be very difficult indeed to obtain responses from the majority of Boards of Pharmacy or

from Colleges. They simply will not answer letters addressed to them in search of information. With a great many of them it is simply impossible to get information of any practical use; but I get as much as I can, and hold the matter open to the last minute, so that I am generally ready when the Proceedings go to press. I certainly appreciate the honor of this election, and the confidence you have shown in me, and can assure you that I shall work in your interests to the best of my ability, during the coming year.

The chair announced that the Chairman and Secretary had chosen for the coming year the same assistant as had been selected the year previous, Mr. H. M. Whelpley.

The Section then adjourned.

REPORT ON LEGISLATION.

BY I. C. HOGAN, SECRETARY.

In ALABAMA an opium law was introduced in the legislature, but was killed by Committee on Legislation.

COLORADO has secured a new law. Board reduced from five to three members. Most important new feature is Section 13, relating to sale of patents.

CALIFORNIA. Amendment adding annual renewal of registration, not to exceed $2 per annum.

CONNECTICUT. Amendment making annual appropriation of $200 for equipment of laboratory and maintaining the same for the purpose of giving practical examinations.

In ILLINOIS the usual bill to repeal the law, and another to amend so as to admit physicians, was introduced, but did not get out of committee.

A bill was also introduced to regulate the patent medicine questions but was strangled by the newspapers and patent medicine men.

KENTUCKY passed what is practically a new law.

MASSACHUSETTS law was materially amended along the line of complaints and prosecutions, appropriating the sum of $2,000 for defrayment of prosecutions.

Complaints of violation must be made in the form of affidavit.

MISSOURI secured an amendment requiring the registration of every certificate in the office of the clerk of the county court in which the holder of the certificate is conducting a pharmacy. The fee for registration is fifty cents. Failure to comply with this provision is made a misdemeanor, punishable by fine of not less than $25 nor more than $100.

Amendments were introduced in New Hampshire, but failed of passage.

NORTH CAROLINA has an amendment to the medical act, exempting R. P's. from jury duty.

OKLAHOMA comes to the front with practically a new law. Section 20 is of interest.

PENNSYLVANIA succeeded in repealing Section 11 of their law, which registered physicians on presentation of diploma.

SOUTH CAROLINA. We have all heard of the State becoming a spirit medium. Pharmacists purchase alcohol of the State in barrel lots at cost, but in less quantities at fifty per cent. advance.

SOUTH DAKOTA has a new law.

TENNESSEE has a new law.

WASHINGTON. Law Amended to provide for examination of assistants.

AMENDMENTS.

Every registered pharmacist who desires to continue the practice of his profession in

this State shall annually, on such date as the Board of Pharmacy may determine, pay to the Secretary of such Board a registration fee, to be fixed by the Board, but which in no case shall exceed the sum of two dollars per annum, for which he shall receive a renewal of said registration. Every registered assistant pharmacist who desires to continue the practice of his profession in this State, shall annually on such date as the Board of Pharmacy may determine, pay to the Secretary of said Board a registration fee to be fixed by the Board, but which shall in no case exceed the sum of one dollar per annum, for which he shall receive a renewal of said registration.

MISSOURI.

SECTION 4613—DUTIES OF BOARD.—The board of pharmacy shall register in a suitable book, a duplicate of which shall be kept in the Secretary of State's office, the names and places of residence of all persons to whom they issue certificates, and dates thereof; and no person having received, or who may hereafter receive, a certificate of registration as a pharmacist, shall engage in business as a pharmacist in any county of this State in which he shall locate, or into which he shall afterward remove, until he shall have had such certificate recorded in the office of the clerk of the county court of such county; and it is hereby made the duty of such county clerk to record such certificate in a book, to be provided and kept for that purpose; and the county clerk is authorized to charge a fee of fifty cents for the recording of each certificate—to be paid by the person offering such certificate for record. Every pharmacist now holding a certificate of registration as a pharmacist, and being engaged in business as a pharmacist, shall have such certificate recorded, as is in this section provided, within thirty days after the taking effect of this act. The record of each certificate required by this act, or a certified copy thereof, shall be evidence in all courts that the person holding it is a registered pharmacist. Any pharmacist failing to comply with the foregoing provisions shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than $25 nor more than $100.

Approved March 31st, 1893.

SOUTH DAKOTA.

AN ACT CREATING A SOUTH DAKOTA PHARMACEUTICAL ASSOCIATION, ESTABLISHING A STATE BOARD OF PHARMACY, AND REGULATING THE PRACTICE OF PHARMACY IN THE STATE.

Be it enacted by the Legislature of the State of South Dakota:

SECTION 1. The registered pharmacists in this State are hereby constituted an association under the name and title of the South Dakota Pharmaceutical Association, the purpose of which shall be to improve the science and art of pharmacy, and to restrict the sale of medicines to regularly educated and qualified persons as provided in this act. The South Dakota Pharmaceutical Association shall report annually to the Governor, recommending the names of at least three members from the district in which the annual vacancy occurs as persons qualified to be appointed upon said board, and the persons so appointed shall constitute the State Board of Pharmaceutical Examiners for South Dakota, and shall hold office for the term of three years or until their successors are appointed and qualified, *provided*, that each member of said board shall be a practicing pharmacist doing a retail drug business in this State; and *provided further*, that the appointments on said board shall be made by the Governor on or before the first day of October in each year, from among the members recommended by said association, one person from each pharmaceutical district as now existing, and the term of office for each member of said board shall be for three years: *provided further*, that the State Board

of Pharmaceutical Examiners as now constituted shall continue until their successors in office are appointed and qualified as provided further in this act. All other vacancies shall be filled by the Governor from the nominees last submitted residing in the district where such vacancy occurs; *provided further*, that the State may be redistricted at any future annual meeting of the association; notice having been sent to each member by the Secretary of the contemplated change at the same time notice of the annual meeting is mailed.

SEC. 2. The Secretary and Treasurer of the South Dakota Pharmaceutical Association shall each respectively be Secretary and Treasurer of the Board of Pharmacy, and they shall each give such bonds as the Association may require. The Secretary shall pay over to the Treasurer all moneys that shall come into his hands as such Secretary, and the Treasurer shall disburse the same only on order of the President of the Association, countersigned by the Secretary. It shall be the duty of the board to examine all applications for registration submitted in due form as provided in the rules and regulations of the board; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; and each member of the board shall investigate all charges brought to his notice in his district, and if in his judgment the charges can be sustained, shall make complaint to the proper prosecuting officer.

SEC. 3. The Board shall hold meetings for the examination of applicants for registration, and the transaction of such other business as shall pertain to its duties at such times and places as the South Dakota Pharmaceutical Association may direct. *Provided*: That special meetings of the Board may be held, whenever it shall be deemed necessary by a majority of the members thereof. It shall be the duty of the Board to report annually to the Governor and to the South Dakota Pharmaceutical Association upon the condition of pharmacy in this State, which said report shall also furnish a record of the proceedings of the said board for the year, and also the names of all the pharmacists duly registered under this act. Said board shall have power to make by-laws and regulations for the proper fulfillment of its duties under this act, and shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, which book shall also specify such facts as such persons shall claim to justify their registration. Two members of said board shall constitute a quorum.

SEC. 4. Any person of good moral character and temperate habits shall, upon approval of this board, be entitled to be registered as a pharmacist within the meaning of this act, who shall be a licentiate in pharmacy, or who shall be a graduate from a reputable college of pharmacy, whose course of study and requirements are approved by the board of pharmaceutical examiners hereinafter provided for; provided, that nothing in this act shall be construed to invalidate any certificate of registration now in force in this State.

SEC. 5. Licentiates in pharmacy shall be such persons not less than eighteen years of age, who have had three years' experience in the practice of pharmacy, or who shall hold a diploma from such medical college as shall be approved by the board, and have passed a satisfacfory examination before the State Board of Pharmacy herein mentioned. The said board may, in their discretion, grant certificates of registration to such persons as shall furnish with their application satisfactory proof that they have been registered by examination in some other State, provided that such other State shall require a degree of competency equal to that required of applicants in this State; and said board may also, in their discretion, under such rules and regulations as may be made by them, issue to applicants for an examination temporary certificates which shall be valid only until the next regular meeting of the board.

SEC. 6. Any person shall be entitled to registration as assistant pharmacist who is of the age of eighteen years, of good moral character, temperate habits, and has had two years of experience in the practice of pharmacy under a registered pharmacist, and shall pass an examination before the State Board of Pharmacy that shall show competency, or

qualification equal to such experience, or who shall hold a certificate of registration as such assistant from the South Dakota Board of Pharmacy at the time this act takes effect. Any registered assistant pharmacist shall have the right to compound medicines or sell poisons under the direct supervision of a registered pharmacist, and he may take charge of a drug store or pharmacy during the temporary absence of the owner or manager thereof. *Provided*, That nothing herein shall be construed as giving such assistant authority to continuously perform any of the duties herein mentioned, except under the supervision and in the presence of the manager.

SEC. 7. Every person applying for registration as a registered pharmacist or registered assistant pharmacist shall pay with his application five dollars, and if upon examination, certificate be not granted, the Secretary shall refund to the applicant three dollars.

SEC. 8. Every registered pharmacist or registered assistant shall annually thereafter, on such date as the South Dakota Pharmaceutical Association may determine, pay to the Secretary an annual registry fee to be fixed by the said Association, which in no case shall exceed the sum of five dollars, for which he shall receive from the Board of Pharmacy a renewal of his certificate of registration. The failure of any registered pharmacist or registered assistant to pay said fee within one year from the date of the expiration of his certificate shall deprive him of the right of such renewal. Every certificate of registration or the renewal thereof granted under this act shall by the person to whom granted be posted in a conspicuous place in the pharmacy to which it applies.

SEC. 9. The Secretary of the Association shall receive a salary which shall be fixed by the Association; he shall also receive his traveling and other necessary expenses incurred in the performance of his official duties. The members of the board shall receive the sum of five dollars for each day actually engaged in its service, and all legitimate and necessary expenses incurred in attending the meetings of said board. Said expenses shall be paid from the fees and penalties received by the Association under the provisions of this act.

SEC. 10. No person shall add to or remove from any drug, medical, chemical or pharmaceutical preparation any ingredient or material for the purpose of adulteration or substitution, which will alter the nature or composition of such drug or other preparation. Any person who shall thus wilfully adulterate or alter, or shall sell or offer for sale any such adulterated or altered preparation, or cause to be substituted one material for another with the intention to defraud or deceive the purchaser, shall be deemed guilty of a misdemeanor, and be liable to prosecution under this act.

SEC. 11. That it shall hereafter be unlawful for any person, other than a registered pharmacist, to retail, compound or dispense drugs, medicines or poisons, or to open or conduct any pharmacy or store for retailing, compounding or dispensing drugs, medicines or poisons, unless such person shall be a registered pharmacist within the meaning of this act, except as herein provided, and any person not being a registered pharmacist within the meaning of this act, who shall keep a pharmacy or store for retailing or compounding medicines, or who shall take, use or exhibit the title of a registered pharmacist, shall be deemed guilty of a misdemeanor, and for each and every offense shall be punished by a fine of fifty dollars upon conviction thereof. Any registered pharmacist who shall permit the compounding or dispensing of prescriptions or the vending of drugs or poisons in his store or place of business except under the supervision of a registered pharmacist, or except by a registered assistant pharmacist, as herein provided, or any pharmacist or assistant who, while continuing in business, shall fail or neglect to procure his annual registration, or any person who shall wilfully make any false representations to procure registration, for himself or any other person, shall be deemed guilty of a misdemeanor and punished by a fine of not less than fifty dollars upon conviction thereof. *Provided*,

That nothing in this act shall apply to, nor in any manner interfere with the business of any physician or prevent him from supplying to his patients such articles as may seem to him proper; and *Provided Further*, That no part of this section shall be so construed as to give the right to any physician to furnish any intoxicating liquors to be used as a beverage on prescription or otherwise.

SEC. 12. No person shall sell any poison named in schedule "A" by retail unless the box, bottle, wrapper or cover in which said poison is contained is distinctly labeled with the name of the article, the name and address of the person selling, and the word poison. And no person shall sell any poison named in schedule "B" to any person unknown to the seller unless introduced by some person known to the seller, and on every sale the seller shall on delivery, make entry in a book kept for that purpose, stating the date of sale, the name and address of purchaser, the name and quantity of the article sold, the purpose for which it is required, and the name of the person if any who introduced him. Any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined ten dollars for every such omission.

SEC. 13. Any member of the Board of Pharmacy or officer therein provided for, who shall wilfully neglect any of the duties provided for in this act, or shall aid or abet any person in the evasion or violation of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than fifty dollars for each and every offense. And any person violating any provision of this act shall be guilty of a misdemeanor and fined not less than fifty dollars unless otherwise provided in this act.

SEC. 14. Whenever the Board of Pharmacy shall be satisfied that any person holding a certificate of registration is for any reason incompetent or disqualified to perform the duties of a registered pharmacist as contemplated by the provisions of this act, they shall have power, upon ten days' notice to such person, to revoke the certificate.

SEC. 15. All penalties collected under the provisions of this act shall inure to the South Dakota Pharmaceutical Association.

SEC. 16. All acts and parts of acts in conflict with this act are hereby repealed.

SEC. 17. That an emergency is hereby declared to exist, and therefore this act shall take effect and be in force from and after its passage and approval.

SCHEDULE "A."

Acetate of lead, Paris green, oxalic acid, carbolic acid, chloral hydrate, chloroform, ether, sulphate of zinc, and other poisonous medicines fatal to human life in doses of from fifteen to sixty grains.

SCHEDULE "B."

Aconite, arsenic, belladonna, opium (except in paregoric and Dover's powder), and their preparations; strychnine, corrosive sublimate, prussic acid, cyanide of potassium, nitric and sulphuric acids, tartar emetic, and other poisonous medicines fatal to human life in doses of fifteen grains or less.

TENNESSEE.

AN ACT TO ESTABLISH A STATE BOARD OF PHARMACY, AND TO REGULATE THE PRACTICE OF PHARMACY, THE SALE OF POISONS, AND TO PROHIBIT THE ADULTERATION OF DRUGS IN THE STATE OF TENNESSEE.

SECTION 1. Be it enacted by the General Assembly of the State of Tennessee, that from and after the passage of this Act it shall be unlawful for any person, not a registered pharmacist, within the meaning of this Act, to open or conduct any pharmacy or retail drug or chemical store as proprietor thereof, unless he shall have in his employ and place

in charge of such pharmacy or retail drug or chemical store, a registered pharmacist within the meaning of this Act, who shall have the supervision and management of that part of the business requiring pharmaceutical skill and knowledge, or to engage in the occupation of compounding or dispensing medicines or prescriptions of physicians, or of selling at retail for medical purposes any drugs, chemicals, poisons, or pharmaceutical preparations within this State until he has complied with the provisions of this Act; provided that nothing in this section shall apply to, or in any manner interfere with the business of any physician, or prevent him supplying to his patients such articles as may seem to him proper, or with the making of patent or proprietary medicines, or with the selling by any store of copperas, camphor, borax, blue vitriol, saltpeter, sulphur, brimstone, licorice, sage, quinine, juniper berries, senna leaves, castor oil, spirits of turpentine, sweet oil, glycerine, Glauber's salt, Epsom salts, cream of tartar, bi-carbonate of sodium, and of paregoric, essence of peppermint, essence of cinnamon, essence of ginger, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, compound cathartic pills, and other similar prep arations when compounded by a regular pharmacist and put up in bottles and boxes bearing the label of such pharmacist or wholesale druggist, with the name of the article and directions for its use on each bottle or box; or with the exclusively wholesale business of any dealer.

SEC. 2. The Executive Committee of the Tennessee State Druggists' Association shall, immediately upon the passage of this Act, submit to the governor the names of ten persons, residents of this State, who have had at least ten years' experience as pharmacists and druggists, and from the names so submitted to him the governor may select and appoint five persons, who shall constitute a board, to be styled the Tennessee Board of Pharmacy; and any member of the Board may be removed by the governor for good cause shown him; one member of said Board shall be appointed and hold his office one year, one for two years, one for three years, one for four years, and one for five years and until their successors shall be appointed and qualified; and at its regular annual meeting in each and every year thereafter, the said Tennessee State Druggists' Association shall select and submit to the governor the names of five persons, with the qualification hereinbefore mentioned, and the governor shall select and appoint from the names so submitted, or other qualified persons, one member of said Board, who shall hold his office for five years, and until his successor shall have been appointed and qualified. Any vacancy that may occur in said Board shall be filled for the unexpired term by the governor upon the recommendation of the remaining members of the Board. Each member of said Board shall, within ten days after his appointment, take and subscribe an oath or affirmation, before a competent officer, to faithfully and impartially perform the duties of his office.

SEC. 3. The Tennessee Board of Pharmacy shall hold one regular meeting each year at Nashville, and such additional meetings, at such times and places as may be determined upon by said Board, at each of which meetings it shall transact such business as is required by law; said Board shall make such rules, by-laws and regulations as may be necessary for the proper discharge of its duties, and shall make a report of proceedings, including an itemized account of all moneys received and expended by said Board, pursuant to this act, and a list of the names of all the pharmacists duly registered under this act to the Secretary of State on or before the 15th day of November, 1893, and annually thereafter, and to the Tennessee State Druggists' Association. Said Board shall keep a book of registration open at some place in Nashville, of which due notice shall be given in three or more newspapers of general circulation in the State, in which the name and place of business of every person duly qualified under this act to conduct or engage in the business mentioned and described in Section 1 shall be registered. Every person now conducting or engaged in such business in this State as proprietor or manager of the

same, or who, being of the age of twenty-one years, has been employed or engaged for five years preceding the passage of this act as an assistant in any retail drug store in the United States in the compounding and dispensing of medicines on the prescriptions of physicians, who shall furnish satisfactory evidence in writing and under oath of such facts within three months after the publication of said notice, shall be registered as a pharmacist without examination. Every person who has attained the age of eighteen years, and who has been continually engaged in the United States for three years prior to the passage of this act, who shall present satisfactory evidence of the same within three months after the publication of said notice, shall be registered as an assistant pharmacist without examination. Every person who shall desire hereafter to conduct or engage in such business in this State, shall appear before said Board and be registered within ten days after receiving a certificate of competency and qualification of said Board. The said Board shall demand and receive from each person registered as a pharmacist a fee of not exceeding $2, and for a certificate as assistant pharmacist a fee of not exceeding $1, to be applied to the payment of expenses arising under the provisions of this act. Every registered pharmacist or assistant pharmacist who desires to continue the practice of his profession, shall annually thereafter during the time he shall continue in such practice, on such date as said Board may determine, pay to the Secretary of said Board a registration fee, to be fixed by said Board, but which shall in no case exceed, if a pharmacist, $1, if assistant pharmacist, 50 cents, for which he shall receive a renewal of said registration. Every certificate of registration granted under this act shall be conspicuously exposed in the drug or chemical store to which it applies, or in which the assistant is engaged. The Secretary of said Board shall receive a salary which shall be fixed by the Board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of said Board shall receive the sum of $3 for each day actually engaged in the service thereof, and all legitimate and necessary expenses incurred in attending the meetings of said Board. Said salary, per diem and expenses, shall be paid after an itemized statement of the same has been rendered and approved by the Board, from the fees and penalties received by said Board under the provisions of this act. All moneys received in excess of said per diem allowance and other expenses above provided for shall be held by the Secretary as a special fund for meeting the expenses of said Board, he giving such bond as said Board may from time to time direct.

SEC. 4. The Tennessee Board of Pharmacy shall examine every person who shall desire to carry on or engage in the business of a retail apothecary or of retailing any drugs, medicines, chemicals, poisons, or pharmaceutical preparations, or of compounding or dispensing the prescriptions of physicians as proprietor or manager, touching his competency and qualifications for that purpose, and upon a majority of the Board being satisfied of such qualifications, and upon the payment by the applicant of an examination fee of $5, they shall furnish the person a certificate of his competency and qualification as a pharmacist, which certificate shall entitle the person therein named to carry on the business aforesaid, as proprietor or manager thereof, upon complying with the requirements of Section 3; and such Board shall also examine each person who desires to engage in such business as assistant pharmacist touching his competency and qualification, and upon such person passing a satisfactory examination, and upon the payment by the applicant of an examination fee of $3, they shall furnish him a certificate, setting forth that he is a qualified assistant in pharmacy, which certificate shall enable the person therein named to engage in said business as an assistant pharmacist upon his complying with Section 3.

SEC. 5. The provisions of Section 4 shall not apply to any person engaged in the retail drug and apothecary business as proprietor or manager of the same at the time of the passage of this act, or who, being of the age of eighteen years, has been continuously employed or engaged for three years immediately preceding the passage of this act

as an assistant in any retail drug store in the United States in the compounding or dispensing of medicines on the prescriptions of physicians, who have complied with the provisions of Section 3.

SEC. 6. No person not a qualified assistant shall be allowed by the proprietor or manager of a retail drug or chemical store to compound or dispense the prescriptions of a physician, except as an aid under the supervision of a registered pharmacist or his qualified assistant.

SEC. 7. A qualified assistant within the meaning of this Act shall be a clerk or an assistant in a retail drug or chemical store, who shall furnish to the Tennessee Board of Pharmacy such evidence of his employment as required in Section 3, or a person holding a certificate of said Board as an assistant pharmacist, as provided by Section 4; but it shall be unlawful for an assistant pharmacist or qualified assistant to supervise or manage any pharmacy or retail drug or chemical store, or to engage in the occupation of compounding or dispensing of medicines on the prescriptions of physicians, or for selling at retail for medicinal purposes any drugs, chemicals, poisons or pharmaceutical preparations, except when engaged or employed in a pharmacy, retail drug or chemical store which is in charge of and under the supervision and management of a regular pharmacist.

SEC. 8. Any person owning a pharmacy, retail drug or chemical store, who in violation of the provisions of Section 1 of this Act, causes or permits the same to be conducted by a person not a registered pharmacist, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not less than $20 nor more than $100, and that each week he shall cause or permit such pharmacy, retail drug or chemical store, to be so conducted or managed, shall constitute a separate and distinct offense, and render him subject to a separate prosecution and punishment. Therefore, a person violating the provisions of Section 3, relating to registration, or failing to conspicuously expose such certificate of registration, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not exceeding $50 for each and every offense; and for the violation of any of Section 7, such assistant pharmacist shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not exceeding $50 for each and every offense. All fines assessed for the violation of any of the provisions of this Act shall be placed in the hands of the Secretary of the Board of Pharmacy to meet the necessary and legitimate expenses of the Tennessee Board of Pharmacy. Provided, that nothing in this Act shall be construed as to in any way affect the right of any person to bring a civil action against any person referred to in this Act, or for any Act or Acts for which a civil action may now be brought. It shall be the duty of the Tennessee Board of Pharmacy, upon application being made to said Board, to cause the prosecution of any person or persons violating any of the provisions of this Act.

SEC. 9. It shall be unlawful for any pharmacist, assistant pharmacist, or proprietor of any retail drug or chemical store, to fraudulently adulterate any drug, chemical or medicine he may sell or dispense, and should he knowingly, intentionally or fraudulently adulterate, or cause to be adulterated, such drugs, chemicals or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be liable to a penalty not to exceed $100, and in addition thereto his name shall be stricken from the register.

SEC. 10. This Act shall not apply to physicians putting up their own prescriptions.

SEC. 11. The provisions of this Act shall only apply to cities and towns having over 3,200 inhabitants, the population always to be computed by reference to the last Federal census.

SEC. 12. All acts and parts of acts in conflict with this Act are hereby repealed.

SEC. 13. This Act shall take effect from and after the date of its passage, the public welfare requiring it.

Passed March 13, 1893.

J. A. TROUSDALE,
Speaker of the House of Representatives.
WILLIAM C. DISMUKES,
Speaker of the Senate.

Approved March 27, 1893.

P. TURNEY, *Governor.*

A true copy:

W. S. MORGAN,
Secretary of State.

The provisions of the Pharmacy Act apply to the following cities and towns: Bristol, Chattanooga, Clarksville, Columbia, Jackson, Johnson City, Knoxville, Memphis, Murfreesborough, Nashville and Union City.

MASSACHUSETTS.

CHAPTER 313, ACTS OF 1885.

AN ACT TO ESTABLISH A BOARD OF REGISTRATION IN PHARMACY.

Be it enacted, etc., as follows:

SECTION 1. The governor of the Commonwealth with the advice and consent of the council shall appoint, after the passage of this act, five skilled pharmacists, resident in the Commonwealth, who have had ten consecutive years of practical experience in the compounding and dispensing of physicians' prescriptions, who shall constitute a Board of Registration in Pharmacy. Such persons shall be appointed and hold office, beginning on the first day of October next, one for one year, one for two years, one for three years, one for four years, and one for five years, or until their successors shall be appointed; and the governor shall appoint annually thereafter before the first day of October in each year one skilled pharmacist, qualified as aforesaid, to hold office for five years from the first day of October next ensuing. Not more than one member of said board shall be interested in the sale of drugs, medicines and chemicals and the compounding and dispensing of physicians' prescriptions in the same city or town. All vacancies occurring in said board shall be filled in accordance with the provisions of this act for the establishment of the original Board. Any member of said board may be removed from office for cause by the governor with the advice and consent of the council.

SEC. 2. The members of said board shall meet on the first Tuesday of October next at such time and place as they may determine, and shall immediately proceed to organize by electing a president and secretary, who shall be members of the Board and who shall hold their respective offices for the term of one year. The secretary shall give to the treasurer and receiver-general of the Commonwealth a bond with sufficient sureties, to be approved by the governor and council, for the faithful discharge of the duties of his office. The said Board shall hold three regular meetings in each year, one on the first Tuesday of January, one on the first Tuesday of May, and one on the first Tuesday of October, and such additional meetings at such times and places as they may determine.

[*SEC. 3. It shall be the duty of said Boad, immediately upon its organization, to notify all persons and firms engaged in the business of retailing or dispensing drugs, medicines, chemicals or poisons on their own account in this Commonwealth, of the provisions of this act; and any such person or firm so engaged, or any other person who has had three consecutive years of practical experience in the aforesaid businesss, shall, upon application and the payment of a fee of fifty cents to said board, be registered as a phar-

* Section 3 was repealed May 11, 1887.

macist, and shall receive a certificate thereof signed by the president and secretary of said board.]

SEC. 4. Any person not entitled to registration as aforesaid shall, upon payment of a fee of five dollars, be entitled to examination, and if found qualified shall be registered as a pharmacist, and shall receive the certificate thereof provided for in section three. Any person may be re-examined at any regular meeting of the board upon the payment of a fee of three dollars. All fees received by the Board under this act shall be paid by the secretary of the board into the treasury of the Commonwealth once in each month.

SEC. 5. The compensation, incidental and traveling expenses of the Board shall be paid from the treasury of the Commonwealth. The compensation of the Board shall be five dollars each for every day actually spent in the discharge of their duties, and three cents per mile each way for necessary traveling expenses in attending the meetings of the board, but in no case shall any more be paid than was actually expended. Such compensation and the incidental and traveling expenses shall be approved by the Board and sent to the auditor of the Commonwealth, who shall certify to the governor and council the amounts due as in case of all other bills and accounts approved by him under the provisions of law: *provided*, that the amount so paid shall not exceed the amount received by the treasurer and receiver-general of the Commonwealth from the Board in fees as herein specified, and so much of said receipts as may be necessary is hereby appropriated for the compensation and expenses of the Board as aforesaid.

SEC. 6. The Board shall keep a record of the names of all persons registered hereunder, and a record of all moneys received and disbursed by said Board, a duplicate whereof shall always be open to inspection in the office of the secretary of the Commonwealth. Said board shall annually report to the governor, on or before the first day of January in each year, the condition of pharmacy in the State, which report shall contain a full and complete record of all its official acts during the year, and shall also contain a statement of the receipts and disbursements of the Board.

SEC. 7. It shall be the duty of the Board to investigate all complaints of disregard non-compliance or violation of the provisions of this act, and to bring all such cases to the notice of the proper prosecuting officers.

SEC. 8. Every person who has received a certificate of registration from the Board shall conspicuously display the same in his place of business.

*SEC. 9. Whoever not being registered as aforesaid shall, by himself or his agent or servant, unless such agent or servant is so registered, retail, compound for sale or dispense for medicinal purposes [or shall keep or expose for sale,] drugs, medicines, chemicals or poisons, shall be punished by a fine not exceeding fifty dollars. But nothing in this act shall be construed to prohibit the employment of apprentices or assistants under the personal supervision of a registered pharmacist.

SEC. 10. This act shall not apply to physicians putting up their own prescriptions or dispensing medicines to their patients; nor to the sale of drugs, medicines, chemicals or poisons at wholesale only; nor to the manufacture or sale of patent and proprietary medicines; nor to the sale of non-poisonous domestic remedies usually sold by grocers or others; nor shall any member of a co-partnership be liable to the penalties hereof if any member of such co-partnership is a registered pharmacist: *provided*, that such non-registered member shall not retail, compound for sale or dispense for medicinal purposes, drugs, medicines, chemicals or poisons except under the personal supervision of a registered pharmacist.

SEC. 11. For the purpose of the appointment of said Board and of registration of persons by them hereunder, this act shall take effect upon its passage, and shall take full effect on the first day of January, in the year eighteen hundred and eighty six.

Approved June 11, 1885.

*Amended April 19, 1893, by inserting "or shall keep or expose for sale."

Chapter 227, Acts of 1893.

An Act Relative to the Sale of Drugs and Medicines.

Be it enacted, etc., as follows:

Section nine of chapter three hundred and thirteen of the acts of the year eighteen hundred and eighty-five is hereby amended by inserting after the word "purposes," in the fourth line, the words:—or shall keep or expose for sale,—so that said section as amended shall read as follows:—*Section 9.* Whoever not being registered as aforesaid shall, by himself or his agent or servant, unless such agent or servant is so registered, retail, compound for sale or dispense for medicinal purposes, or shall keep or expose for sale, drugs, medicines, chemicals or poisons, shall be punished by a fine not exceeding fifty dollars. But nothing in this act shall be construed to prohibit the employment of apprentices or assistants under the personal supervision of a registered pharmacist.

Approved April 19, 1893.

Chapter 472, Acts of 1893.

An Act Relative to Complaints against Registered Pharmacists.

Be it enacted, etc., as follows:

Section 1. The Board of Registration in pharmacy shall investigate all complaints made to them against any person registered as a pharmacist, under the provisions of chapter three hundred and thirteen of the acts of the year eighteen hundred and eighty-five, charging him with suffering or permitting the use of his name or his certificate of registration by others in the conduct of the business of pharmacy, when he himself is not the owner and actively engaged in such business; engaging in, aiding or abetting, or, in his business as a pharmacist, violating any of the laws of the Commonwealth now under the supervision of the Board of Registration in Pharmacy, and especially the laws relating to the sale of intoxicating liquor. Such complaint shall be a sworn statement, and shall be made within fifteen days of the date of the act complained of.

Sec. 2. Said Board shall notify the person complained against, of the charge made against him, and of the time and place when and where the matter will be heard by them. He may then and there appear before the Board with his witnesses and be heard by counsel. Any three of the members of the Board shall be a quorum for such hearing. Either member of the Board may administer oaths to the witnesses at such hearing, and any person so sworn who wilfully swears or affirms falsely respecting any matter upon which his testimony is required shall be deemed guilty of perjury.

Sec. 3. If the full Board, sitting at such hearing, shall find that the person complained against is guilty of the act or acts charged against him, said Board may suspend his registration as a pharmacist and his certificate thereof, for such terms as the Board in their judgment, after due consideration of all facts, may deem for the best interest of the public, not exceeding for the first offence one year, unless the case should be a flagrant one, and in such cases may revoke it altogether; but the license or certificate of registration of a registered pharmacist shall not be suspended or revoked for a cause punishable by law, until after conviction by a court of competent jurisdiction.

Sec. 4. Any person not being a registered pharmacist who shall procure a sixth-class license to sell intoxicating liquor, in the name of a registered pharmacist who is dead, or in the name of a registered pharmacist by borrowing, hiring or purchasing the use of his certificate, and being himself the owner or manager of the place, shall by himself or his servant sell intoxicating liquor, shall upon conviction thereof be fined not less than fifty dollars nor more than five hundred dollars, and imprisoned in the house of correction for a term of not less than one month nor more than six months, and the provisions of section eight of chapter two hundred and fifteen of the Public Statutes shall not apply to such sentence.

SEC. 5. Any license of the sixth class shall cease and become null and void, without any process or decree, whenever the registered pharmacist to whom it has been granted shall cease to conduct his business in person and on his own account, or upon the revocation of his registration as such pharmacist, and of his certificate thereof; excepting cases where the registered pharmacist has died or become incapacitated, and his business is continued by his widow, executor, or administrator, under a registered pharmacist.

SEC. 6. It shall be the duty of the Board of Pharmacy to prosecute all persons violating Section 4 of this act.

SEC. 7. In order to properly carry out the provisions of this act, the board of registration in pharmacy may expend annually a sum not exceeding *two thousand dollars*, and an itemized statement of all expenses incurred shall be filed with the Auditor of the Commonwealth, who, after they have been properly approved, shall allow them in the same manner as other claims against the Commonwealth.

SEC. 8. This act shall take effect upon its passage.

Approved June 10, 1893.

CHAPTER 270, ACTS OF 1889.

AN ACT RELATING TO THE GRANTING OF LICENSES TO DRUGGISTS AND APOTHECARIES TO SELL INTOXICATING LIQUOR.

Be it enacted, etc., as follows:

SECTION 1. No license of the sixth class described in Section 10 of chapter one hundred of the Public Statutes shall hereafter be granted to any person who is not a registered pharmacist actively engaged in business on his own account. Any license granted in violation of this act shall be void.

SEC. 2. This act shall take effect upon its passage.

Approved April 18, 1889.

CHAPTER 209, ACTS OF 1888.

AN ACT REGULATING THE SALE AND PURCHASE OF POISONS.

Be it enacted, etc., as follows:

SECTION 1. Section six of chapter two hundred and eight of the Public Statutes is hereby amended so as to read as follows:—*Section 6.* Whoever sells arsenic (arsenious acid), atropia or any of its salts, chloral hydrate, chloroform, cotton root and its fluid extract, corrosive sublimate, cyanide of potassium, Donovan's solution, ergot and its fluid extract, Fowler's solution, laudanum, McMunn's elixir, morphia or any of its salts, oil of pennyroyal, oil of savin, oil of tansy, opium, Paris green, Parsons' vermin exterminator, phosphorus, prussic acid, "rough on rats," strychnia or any of its salts, tartar emetic, tincture of aconite, tincture of belladonna, tincture of digitalis, tincture of nux vomica, tincture of veratrum viride, without the written prescription of a physician, shall keep a record of such sale, the name and amount of the article sold, and the name and residence of the person or persons to whom it was delivered, which record shall be made before the article is delivered, and shall at all times be open to inspection by the officers of the district police and by the police authorities and officers of cities and towns. Whoever neglects to keep or refuses to show to said officers such record shall be punished by fine not exceeding fifty dollars. Whoever sells any of the poisonous articles named in this section, without the written prescription of a physician, shall affix to the bottle, box or wrapper containing the article sold a label of red paper upon which shall be printed in large black letters the word—Poison, and also the word—Antidote, and the name and place of business of the vendor. The name of an antidote, if there be any, for the poison sold shall also be upon the label. Every neglect to affix such label

to such poisonous article before the delivery thereof to the purchaser shall be punished by fine not exceeding fifty dollars. Whoever purchases poisons as aforesaid and gives a false or fictitious name to the vendor shall be punished by fine not exceeding fifty dollars: *Provided*, That nothing in this act shall be construed to apply to wholesale dealers and to manufacturing chemists in their sales to the retail trade.

SEC. 2. Chapter thirty-eight of the acts of the year eighteen hundred and eighty-seven, entitled "An Act Regulating the Sale and Purchase of Poisons," is hereby repealed.

SEC. 3. This act shall take effect upon its passage.

Approved April 10, 1888.

KENTUCKY.

AN ACT TO ESTABLISH A STATE BOARD OF PHARMACY, DEFINING ITS DUTIES AND POWERS, AND TO REGULATE THE PRACTICE OF PHARMACY IN THE COMMONWEALTH OF KENTUCKY.

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

SECTION 1. Within sixty days after the enactment of this law, the Governor shall appoint five persons from among the Pharmacists of the State, who have been recommended by the Kentucky Pharmaceutical Association, which recommendation shall include not less than ten of said pharmacists, who shall constitute the Kentucky Board of Pharmacy. It shall be the duty of each member of said Board, before entering upon the discharge of his duties, to appear before an officer authorized to administer oaths in this State, and make oath to properly and faithfully discharge the duties of a member of the Board.

SEC. 2. One of the said members shall hold office for one year, one for two years, one for three years one for four years and one for five years, which term shall be determined by vote at the first meeting of said Board of Pharmacy. The members of the Board shall meet at such time and place as may be designated by the member whose name is first on the list of appointments, and shall first proceed to determine, by vote, the respective terms for which they shall serve, and shall organize by electing a President, Treasurer and Secretary, who shall hold their offices for the term of one year, or until their successors are elected and qualified. They shall receive such compensation as the Board may fix. Thereafter the Board shall meet at least twice in each year, and any three members of the Board shall constitute a quorum. The Board shall have the power to make such by-laws as it may deem necessary, not inconsistent with law.

SEC. 3. The Kentucky Pharmaceutical Association shall, at each annual meeting, nominate four registered pharmacists, from whom the Governor shall fill the vacancy annually occurring in said Board, and the person so appointed shall qualify as provided in Section 1, and hold his office for five years. In case of vacancy occurring in the Board from any other cause than expiration of time, the Governor shall fill the vacancy by appointment from the list of nominations last made. Removal from the State or permanent discontinuance of business shall be considered a vacation of this office.

SEC. 4. It shall be the duty of said Board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this Act; to report annually to the Governor and to the Kentucky State Pharmaceutical Association upon the condition of Pharmacy in the State, which report shall furnish a record of the proceedings of said Board for the year, and also the names and residences of the pharmacists duly registered under this act.

SEC. 5. The following classes of persons shall be entitled to registration as pharmacists, upon the terms and conditions hereinafter expressed: First. Any person who, at the time of the passage of this act, is carrying on the business of pharmacist on his own account, that is, retailing drugs, medicines and poisons, and dispensing and compound-

ing prescriptions of medical practitioners, and who shall, within six months after the enactment of this law, forward to said Board of Pharmacy his affidavit, accompanied by the affidavit of two disinterested persons, who are certified by a county judge or justice of the peace of this State to be reputable citizens, that the applicant was so engaged in business on his own account in this State at the time of the passage of this act. Second. Any person who, at the time of his application, shall have had three years' experience as pharmacist, and who shall pass a satisfactory examination before the State Board of Pharmacy. Third. Any person who, at the time of the passage of this act, holds a certificate of registration as assistant pharmacist, or who has for three consecutive years immediately preceding the passage of this act, been engaged as clerk in a retail drug store where prescriptions are compounded, may, with the consent of the Board of Pharmacy, and without examination, be registered as a pharmacist, and receive a certificate thereof. Fourth. Graduates of any school or college of pharmacy duly incorporated by the General Assembly of Kentucky, which shall, in addition to a theoretical course of study, require at least three years' practical experience in the drug business as a requisite for graduation. Fifth. Any graduate of a regular incorporated school of medicine, who is practicing and compounding medicines in this State, and who at the time of his application for registration had been practicing and compounding medicines in this State for five years. Sixth. Any regular practitioner of medicine who is practicing and compounding medicines in this State, and who, at the time of the enactment of this law, had been practicing and compounding medicines in this State for ten years immediately preceding the enactment of this law. No person under eighteen years of age shall be entitled to registration under this law as a pharmacist. Seventh. Any pharmacist now having a certificate of qualification as such shall not be required under this law to obtain another certificate.

SEC. 6. Every applicant for registration under this law shall make written application to the said Board of Pharmacy for such registration, accompanied by a written statement, signed by the applicant in his own hand, and duly verified before an officer authorized to administer oaths in this State, fully setting forth the grounds upon which such application is made. The Board of Pharmacy shall have power to make such rules and regulations for the examination of applicants for registration, and the granting of certificates and the payment of license fees, as it may see proper, not inconsistent with the provisions of this law.

SEC. 7. Every application for registration shall be accompanied by a fee of five dollars, which shall, as far as necessary, be devoted to defraying the expenses of the Board, and paying its officers such compensation as the Board may fix.

SEC. 8. It shall be unlawful for any person to retail, compound or dispense medicines or poisons for medical uses within this State, without first obtaining a certificate of registration as pharmacist from the State Board of Pharmacy, and causing the same to be recorded in the office of the clerk of the county court in the county wherein said person proposes to carry on such business.

SEC. 9. The following medicines shall be considered poison within the meaning of section ten of this act and shall be sold under the requirements of said section: One. Aconite (Monk's hood) root and leaf, as follows: Aconitia and its salts, solid and fluid extracts, tincture. Two. Acids (not diluted), nitric, sulphuric, chromic, hydrocyanic and muriatic. Three. Ether. Four. Arsenic and the following compounds and preparations: arsenic acid and its salts, arsenious acid and its salts, arsenic iodide, Donovan's solution, Fowler's solution, hydrochloric solution, arsenite of sodium, paris green. Five. Belladonna (nightshade) root and leaf, atropia and its salts, solid and fluid extract and tincture. Six. Bitter almonds and its preparations. Seven. Hellebore, green, black and white and their preparations. Eight. Creosote. Nine. Cohosh, black and blue, and their preparations. Ten. Physostigma (calabar bean) eserine, solid and fluid ex-

tract and tincture. Eleven. Cannabis indicas and sativa and their preparations. Twelve. Cantharides and the tincture. Thirteen. Croton oil. Fourteen. Cotton-root bark and its preparations. Fifteen. Conium (hemlock,) conia, bromohydrate of conia, solid and fluid extract and tincture. Sixteen. Cocaine and its preparations. Seventeen. Chloral hydrate. Eighteen. Chloroform. Nineteen. Cocculus (fish berries) and its preparations. Twenty. Curari or wouri (arrow poison) and its preparations. Twenty-one. Digitalis (foxglove) solid and fluid extract tincture and digitaline. Twenty-two. Elaterium (squirting cucumber) and its preparations. Twenty-three. Hyoscyamus (henbane) and its preparations. Twenty-four. Hydrargyrum (mercury), mercuric chloride, bi-chloride of mercury, ammoniated chloride of mercury (white precipitate,) per-chloride, iodide, red and green, oxide, red and yellow, cyanide, yellow sulphate, and nitrate of mercury and all of their preparations. Twenty-five. Nitrate of silver (Lunar caustic). Twenty-six. Ignatiae strychnos (bean of St. Ignatius) and its preparations. Twenty-seven. Ergot and its preparations. Twenty-eight. Nux Vomica, strychnine, brucia, igasuria, solid and fluid extracts and tincture. Twenty-nine. Opium, morphine and its salts, tinctures (laudanum deodorized, acetic and ammoniate), wine vinegar, solid and fluid extracts, Bailey's sedative, bimeconate of morphia. Thirty. Phosphorus (fox-fire) and its preparations. Thirty-one. Potassium (potash), caustic, cyanide and their preparations. Thirty-two. Ferro-cyanide (Prussian blue). Thirty-three. Poison oak (toxicodendron) and its preparations. Thirty-four. Savine and the fluid extract. Thirty-five. Scammony and its preparations. Thirty-six. Sodium, caustic and arsenite of soda. Thirty-seven. Oil of tansy. Thirty-eight. Oil of Pennyroyal. Thirty-nine. Stramonium (Jamestown weed,) flower seed, daturia stramonium, solid and fluid extracts. Forty. Nitro-glycerine and nitro-benzol, proprietary or secret medicines sold or advertised as emmenagogue or parturients, and all that are known to contain a large proportion of opium or other powerful narcotics.

SEC. 10. Poison, when sold, shall bear a label on each package or bottle in a prominent place, on which shall be the following: The word "poison" in large letters, a picture of a human skull and cross-bones; the dose for an adult; some practical antidote for the poison, and the name of the pharmacist selling it. It shall be unlawful for any druggist to sell poison without being satisfied that the buyer is of lawful age, and knows the danger of the poison bought, and that the poison is bought for a legitimate use. Any druggist retailing poison, before delivering the poison sold, shall cause to be made an entry in a book, kept for that purpose, the name of the poison, and the quantity bought, to whom sold, and the address of the purchaser; the purpose for which it is stated by the purchaser to be required, and the date of the sale. Such record shall be kept for five years after the last entry, and is to be open to the inspection of the coroner and the courts. Any person failing to comply with the requirements of this section shall, upon conviction, be fined fifty dollars, and liable for all damage done.

SEC. 11. No person shall add to, or remove from, any drug, medicine or chemical preparation, any ingredient for the purpose of adulteration, substitution or alteration, which shall detract from the quality, commercial value, medical effect, alter the nature or composition of such an article, and any person who shall knowingly sell, or offer to sell, such altered, adulterated or substituted drug, medicine or chemical, without informing the purchaser, and writing the word adulterated, altered or substituted, as it may be, on the package, shall be fined, on conviction, fifty dollars, and be liable for the damage done. Any medicine or drug used after becoming inert from age or exposure shall be deemed a substitution. The Board of Pharmacy shall make a chemical examination of any package or bottle of medicine, drug or chemical, simple or compound, forwarded to them, accompanied with a verbatim prescription or name of ingredients and quantity, which is suspected of adulteration, alteration or substitution; after making such examination shall return a written analysis to the person sending it, for which the person shall pay a rea-

sonable fee, not to exceed thirty dollars. Every pharmacist shall cause to be filed all physicians' prescriptions, and shall preserve them for two years, after having numbered them serially so as to correspond to a like number to be placed upon each bottle or package containing the medicine named in such prescription. The pharmacist shall furnish a duplicate of any prescription on the application or order of attending physician.

SEC. 12. Before any person who may have registered as a pharmacist, and obtained a certificate thereof, shall commence or continue the business of a pharmacist in any county of this Commonwealth, he shall lodge said certificate with the county clerk of the county wherein such business is carried on, or is to be carried on, which shall be recorded by said clerk in a book to be kept in his office for such purpose, and indorse his certificate of such recording of the said certificate of registration and deliver the same to the owner thereof, within the first ten days of the next ensuing January; and annually thereafter the said pharmacist, if he continue in business or intends to continue in business, shall go before the county court in the county in which he is doing business or intends to do business, and apply for a renewal of his license, and upon producing his certificate of registration, he shall be entitled to a renewal certificate, under which he may conduct such business. For each record of certificate of registration the county clerk shall be entitled to a fee of fifty cents, and for each renewal thereof a fee of fifty cents, which shall be paid by the pharmacist receiving same. It shall be the duty of each county court clerk in this State to keep constantly at hand a correct list of the registered pharmacists in the county, whose certificates are recorded in his office, and of the renewals issued by him, and report same in writing to the last grand jury empaneled in his county each year; and during the month of February of each year he shall make a full and correct list of the registered pharmacists in his county, and forward the same to the Secretary of the State Board of Pharmacy. For each failure to perform his duties under this Act such clerk shall be fined fifty dollars.

SEC. 13. Any person not being a registered pharmacist, or who shall not have complied with all the provisions of this law, who shall take, exhibit or use the title of pharmacist, or who proposes to, or does compound or dispense prescriptions of medical practitioners, or retail medicines or poisons to be used as medicines, or shall, in any way, violate the provisions of this law, shall be subject to indictment for each offense, and, upon conviction, shall be fined for the first offense twenty-five dollars, and for the second offense shall be fined fifty dollars, and for each subsequent violation he shall be fined one hundred dollars.

SEC. 14. Nothing in this law shall be construed to apply to the business of a licensed practitioner of medicine, nor to prevent such practitioner from supplying his patients with such articles as he may deem proper; but no licensed practitioner of medicine shall be entitled to carry on or conduct the practice of the business of pharmacy in this State without obtaining registration as a pharmacist; nor to those who sell medicines or poisons by wholesale only; nor to the manufacture or sale of proprietary medicines. Nothing in this law shall be so construed as to prohibit the employment in any pharmacy of apprentices or assistants for the purpose of being instructed in the practice of pharmacy; but such apprentices or assistants shall not be permitted to prepare or dispense physicians' prescriptions, or to sell or furnish medicines or poisons except in the presence of, or under the personal supervision of, a pharmacist, registered and licensed under this law, nor to prevent any one not a registered pharmacist under this law from owning a pharmacy; *provided*, the duties and business of pharmacy are in charge of, and under the control of, a registered pharmacist under this law.

SEC. 15. Nothing in this law shall be so construed as to prohibit any person from selling the following articles: Arnica, assafoetida, arrow root, balsam fir, bay rum, blue mass, blue stone, borax, buchu leaves, burdock, cocoa butter, aromatic acid, alcohol, aloes, alum, ammonia, acacia gum, boracic acid, Crab Orchard salts, cobalt, cod-liver oil,

collodion, columba, confection of senna, cream of tartar, sulphate of copper, camphor gum, cardamon seed, chamomile, cinchonidia, citrate of potash, dulcamara, elecampane, epsom salts, fenugreek, ferri carbonas, ferri et quinia, ferri tincture, ferri dialysed, figs syrup of, gentian, glauber salts, ginger, glycerine, glycerite of borax, hamamelis virginica, hive syrup, calomel, chalk mercury, hydrastis, ipecac, jalap, kumyss, liniment mercurial, lithia water, lobelia top and leaves, log wood, magnesia, may apple root, myrrh, nitre spt., oil olive, oil castor, pepsin, pills cathartic, pulverized rhubarb, quinine, Rochelle salts, rosin, salicylic acid, saltpetre, sarsaparilla, senna, potash bitartrate, potash carbonate, sulphur, paregoric, spt. turpentine, carbolic acid, soda bicarbonate, tannic acid.

SEC. 16. Persons who, at the time of the enactment of this law, hold certificates of registration as pharmacists or assistant pharmacists, shall not be required to register under this law, but shall file their certificates of registration with the county clerk for record, and take out renewals thereof, as provided in section two of this law, and in all other respects shall be amenable to the provisions of this law.

SEC. 17. That nothing in this law shall apply to persons selling drugs or medicines in towns of less than one thousand inhabitants.

W. M. MOORE,
Speaker House of Representatives.
D. H. SMITH,
President Pro Tem. Senate.

Approved July 1st, 1893.
JOHN YOUNG BROWN, *Governor.*
By the Governor,
JOHN W. HEADLEY, *Secretary of State.*

COMMONWEALTH OF KENTUCKY,
Office of Secretary of State.

I, JOHN W. HEADLEY, Secretary of State for the Commonwealth aforesaid, do hereby certify that the foregoing writing has been carefully compared by me with the original on file in this office, whereof it purports to be a copy, and that it is a true and exact copy of the same.

IN TESTIMONY WHEREOF, I hereto sign my name, and cause my Official Seal to be affixed. Done at Frankfort this 17th day of July, A. D. 1893.

JOHN W. HEADLEY,
Secretary of State.

By EDWARD O. LEIGH,
Assistant Secretary of State.

OKLAHOMA.

CHAPTER LXI., PHARMACY.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY IN THE TERRITORY OF OKLAHOMA AND PROVIDING PENALTIES FOR THE VIOLATION OF THE SAME.

[Took effect December 25, 1890, amended March 14, 1893.]

Be it enacted by the Legislative Assembly of the Territory of Oklahoma:

(3624) SECTION 1. That it shall be unlawful for any person, unless a qualified pharmacist within the meaning of this act, to open or conduct any pharmacy, or for any one not a qualified pharmacist to prepare physicians' prescriptions or compound medicines, except under direct supervision of a qualified pharmacist, as hereinafter provided.

(3625) SEC. 2. Any person, in order to be qualified, shall be twenty-one years old, and shall have passed a satisfactory examination before the Board of Pharmacy of Oklahoma Territory, or shall be a graduate in pharmacy as hereinafter provided.*

* Act of March 14, 1893.

(3626) SEC. 3. Graduates in pharmacy within the meaning of this act shall be such as have obtained a diploma from a recognized college of pharmacy.

(3627) SEC. 4. Assistants in pharmacy must be eighteen years old, and have had two years experience in stores where prescriptions of medical practitioners have been prepared and shall have passed a satisfactory examination before the Board of Pharmacy of Oklahoma Territory.

(3628) SEC. 5. Within thirty days after the approval of this act, the Governor shall appoint a Board of Pharmaceutical Examiners who shall hold their offices for one, two and three years, respectively, which appointments shall be in writing and signed by the Governor and Secretary of the Territory, and delivered to the persons appointed. Said Board of Pharmacy shall be composed of three qualified pharmacists, who are residents of the Territory, no two of whom shall be residents of the same county, and who shall have had at least five years' experience in the actual practice of pharmacy, which three are to be selected from ten names recommended by the Oklahoma Pharmaceutical Association. If a vacancy occur in said Board, another shall be appointed as aforesaid to fill the unexpired term. At the expiration of each term of office of a member, the Governor shall appoint his successor, who shall hold his office for three years. Said Board shall have power to make By-Laws and all necessary regulations consistent with the provisions of this Act, for the proper fulfillment of their duties.*

(3629) SEC. 6. The Board shall meet four times a year, to wit: on the first Tuesday in the months of January, April, July and October. The Board shall organize by electing a President, Secretary and Treasurer, who shall hold their respective offices for one year, and until their successors are elected. The duties of said Board shall be to examine all applicants for registration, and to direct the registration, by the Secretary, of all persons properly qualified or entitled thereto.*

(3630) SEC. 7. The members of the Board of Pharmacy shall receive as compensation for their services five dollars a day and necessary expenses for each day actually employed at the meetings of said Board, to be paid out of the Territorial treasury: *Provided*, Such compensation and expenses shall at each meeting of the Board not exceed the amount received by said Board for examinations and certificates at such meeting.

(3631) SEC. 8. It shall be the duty of the Secretary of the Board of Pharmacy to keep a book in which shall be entered under the supervision of the Board of Pharmacy the name and place of business of every person who shall apply for registration, and a statement signed by the person making the application of such facts as he or she may claim to justify his or her application. It shall also be the duty of the Secretary to duly note the fact against the name of any qualified pharmacist who may have died, or removed from the Territory, or disposed of or relinquished his business; a copy of which book, corrected quarterly, shall, by the Secretary of such Board, be placed on file in the office of the Secretary of the Territory, and certified copies of the record so filed, certified by the Secretary of the Territory, shall be evidence in all criminal prosecutions under this act and of equal force with the original. Registered pharmacists who have voluntarily retired from business for a period not exceeding one year, shall not forfeit their registration; *provided*, they shall comply with section 17 of said [this] chapter.*

(3632) SEC. 9. Any person in order to become a qualified pharmacist within the meaning of this Act, shall apply and appear for examination and registration, and shall pay to the Board of Pharmacy five dollars, which shall be turned into the Territorial treasury, and on passing the examination required, shall be furnished free of cost a certificate of registration, signed by said Board. Should said person fail to pass a satisfactory examination, he may at any other one meeting of the Board of Pharmacy within twelve months, be permitted to be examined without cost.

*Act of March 14, 1893.

(3633) SEC. 10. Graduates as specified in section three, shall apply for registration, and if they produce satisfactory evidence to the Board of Pharmacy that they have a right to be registered, shall, upon paying the said Board three dollars, be furnished a certificate of registration without examination.

(3634) SEC. 11. That the provisions of this act shall not prevent any person from engaging in the business herein described, as proprietor or owner thereof; *provided*, such proprietor or owner shall have employed in his business some registered pharmacist to fill prescriptions and compound drugs.*

(3635) SEC. 12. Any person receiving a certificate of registration shall place it in a conspicuous place in his place of business; failing to do this, the Board of Pharmacy shall cancel his registration and deprive him of his certificate.

(3636) SEC. 13. Any person who continues to compound prescriptions or retail medicines without complying with this act, shall, upon conviction thereof, be sentenced to pay a fine of not less than fifty dollars nor more than one hundred dollars, and upon the second and every subsequent conviction, shall be sentenced to a fine of not less than one hundred dollars nor more than two hundred dollars, and imprisonment for ninety days in [the] county jail.

(3637) SEC. 14. Any person who shall procure registration for himself or for another under this act by making or causing to be made any false representation, shall be guilty of a misdemeanor, and shall be fined not less than twenty-five dollars nor more than one hundred dollars, and the name of the person so fraudulently registered shall be stricken from the register.

(3638) SEC. 15. That the Board of Pharmacy be, and they are hereby, authorized to institute and maintain suits and prosecutions under the provisions of said chapter, and this act, in the name of the Territory of Oklahoma.*

(3639) SEC. 16. All courts having jurisdiction in criminal causes are required to give this act in charge to each grand jury impanelled in such courts.

(3640) SEC. 17. It shall be the duty of every registered pharmacist or assistant pharmacist, upon changing his place of business, from one town to another, forthwith to notify by letter the Secretary of the Board of Pharmacy of such change, and to enclose a fee of fifty cents, upon receipt of which the secretary shall make the necessary alteration on his register. It shall also be the duty of every registered pharmacist, or assistant pharmacist, to notify by letter said secretary on the first day of July in each year, whether he still continues practicing pharmacy at registered place of business. The secretary shall notify every person who shall not have notified the Board as herein provided, and in case an answer enclosing a fee of fifty cents shall not be received by the secretary within thirty days, such name shall be stricken from the register: *Provided, always*, That his name may be restored to the register on the payment to the secretary within one year, of a fee of five dollars. It shall be the duty of the secretary of the Board to erase from the register the names of registered pharmacists who may have died, removed from or ceased to do business in this Territory, and to make all the necessary alterations in the locations of the persons registered under this act; he shall publish annually a list of all persons that are registered as pharmacist and assistant pharmacist, a copy of which shall be mailed free to each and every registered pharmacist and assistant pharmacist in the Territory.

(3641) SEC. 18. No one who habitually uses intoxicating liquors as a beverage shall be appointed on the Board of Pharmacy, nor be licensed as a pharmacist or assistant pharmacist. The Examining Board shall in all cases require each applicant to file his written declaration duly sworn to to the effect that he does not habitually use vinous, malt or alcoholic liquors as a beverage, and that he has not since January 1, 1891, been engaged in the business of selling liquors in the Territory of Oklahoma. If said affidavit be filed after January 1, 1893, the applicant shall then swear that he has not been en-

* Act March 14, 1893.

gaged in the business of selling intoxicating liquors in the Territory of Oklahoma within the two years last past, and that he does not use intoxicants as before stated. Any one swearing falsely, in the affidavit so filed, shall be guilty of perjury.

(3642) SEC. 19. It shall be unlawful for any person, from and after the passage of this act, to retail any of the following poisons, except as follows: Arsenic, and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnine, and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce, aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid and oxalic acid, without distinctly labeling the box, vessel or paper in which the said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison" and the name and place of business of the seller. Nor shall it be lawful for any registered pharmacist to sell any of the poisons above enumerated without, before delivering the same to the purchaser, causing an entry to be made in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name of the poison sold, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser, such book to be always open for inspection by the proper authorities, and to be preserved for, at least, five years. The provisions of this section shall no-apply to the dispensing of poisons, in not unusual quantities, or doses, upon the prescriptions of practitioners of medicine. Any violation of the provisions of this section shall make the offender liable for a fine of not less than twenty-five dollars, and not more than one hundred dollars, and upon conviction for the second offense, in addition to the fine, he shall have his name stricken from the register.*

(3643) SEC. 20. Any intinerant vendor of any drug, nostrum, ointment or appliance of any kind, intended for the treatment of diseases, or injury, who shall, by writing or printing, or any other method, publicly profess to cure or treat diseases, or injury or deformity, by any drug, nostrum or manipulation, or other expedient, shall pay a license of one hundred dollars for the term of one year or less, to be paid to the Treasurer of the Board of Pharmacy, and by him paid into the Territorial treasury; whereupon the Secretary of the Board shall issue a license for one year. Any person violating this section shall be deemed guilty of a misdemeanor, and shall, upon conviction, be fined in any sum not less than one hundred nor more than two hundred dollars.*

(3644) SEC. 21. That all laws and parts of laws in conflict with this act be and the same are hereby repealed, and that this act shall take effect and be in force from and after its passage.

COLORADO.

AN ACT IN RELATION TO THE PRACTICE OF PHARMACY AND THE SALE OF MEDICINES AND POISONS, LICENSING PERSONS TO CARRY ON SUCH PRACTICE, AND EXEMPTING THEM FROM JURY DUTY; PROVIDING FOR THE APPOINTMENT AND PRESCRIBING THE POWERS AND DUTIES OF A STATE BOARD OF PHARMACY; AND TO REPEAL AN ACT ENTITLED "AN ACT REGULATING THE PRACTICE OF PHARMACY, LICENSING PERSONS TO CARRY ON SUCH PRACTICE, AND EXEMPTING THEM FROM JURY DUTY; PROVIDING FOR THE APPOINTMENT, AND PRESCRIBING THE POWERS AND DUTIES OF A BOARD OF PHARMACISTS," APPROVED MAY 2, 1887.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. That it shall hereafter be unlawful for any person other than a registered

* Act of March 14, 1893.

pharmacist or an assistant pharmacist, as hereinafter defined, to retail, compound or dispense drugs, medicines or pharmacal preparations in the State of Colorado: or to institute, conduct or manage a pharmacy, store or shop for the retailing, compounding or dispensing of drugs, medicines or pharmacal preparations in said State of Colorado, unless such person shall be a registered pharmacist, as the act provides, or shall place in charge of said pharmacy, store or shop, a registered pharmacist, except as hereinafter provided.

SEC. 2. "Registered Pharmacists" shall comprise all persons regularly registered as such in the State of Colorado for the year ending July 2, 1893; and all other persons registered as licentiates in pharmacy for the aforesaid period, who have been authorized to conduct or manage a pharmacy in the State of Colorado; and all persons over twenty-one years of age, having four years' practical experience in compounding and dispensing physicians' prescriptions, who shall pass a satisfactory examination before the State Board of Pharmacy. Graduates in pharmacy who have obtained diplomas from such colleges and schools of pharmacy as shall be approved by the Board of Pharmacy, and who, previous to obtaining said diploma, have had four years' experience in the dispensing of physicians' prescriptions, may, on payment of a fee of five dollars, be made registered pharmacists.

SEC. 3. "Assistant pharmacists," in the meaning of this act, shall comprise all persons regularly registered as licentiates in pharmacy in the State of Colorado for the year ending July 2, 1893; who have been authorized to "assist in the dispensing and compounding of physicians' prescriptions" under the supervision of a properly qualified person; and all persons over eighteen years of age, having two years' practical experience in the compounding and dispensing of physicians' prescriptions, who shall pass such examination as the State Board of Pharmacy shall require. Assistant pharmacists shall not be permitted to conduct or manage a pharmacy on their own account, nor assume the management of such business for others.

SEC. 4. Immediately upon the passage of this act, and biennially thereafter, the Colorado Pharmacal Association may submit to the Governor of the State of Colorado the names of ten or more registered pharmacists having at least ten years' practical experience as dispensing pharmacists; and from this number the Governor shall appoint three: and the said three registered pharmacists shall constitute the State Board of Pharmacy of the State of Colorado, to have and to hold office for the term of two years, or until their successors shall have been duly qualified. In case of resignation or removal from the State of any member of said Board, or a vacancy occurring from any cause, the Governor shall appoint a registered pharmacist to serve as a member of the Board for the remainder of the unexpired term.

SEC. 5. The said Board shall, within thirty days after its appointment, meet in the city of Denver, and organize, by the selection of a president, secretary and treasurer, who shall serve for the term of one year, and who shall perform the duties prescribed by the Board. Meetings for the examination of applicants for registration, granting of certificates, and the transaction of such other necessary business, shall be held at least once in four months, and at such time and places as may be fixed upon by the Board; *provided*, that ten days' public notice of the time and place of each meeting at which there is an examination of candidates for registration shall be given. It shall be the duty of the Board to receive all applications for examination and registration submitted in proper form, to grant certificates to such persons as may be entitled to the same under this act; to cause the prosecution of all persons violating any of the provisions of this act; to report annually to the Governor and to the State Pharmacal Association upon the condition of pharmacy in the State of Colorado, which report shall furnish also a record of the proceedings of the Board, as well as the names of all persons registered under this act; to keep a book for registration in which shall be entered the names and places of

business of all persons registered under this act, on what grounds and under which particular section of this act each was registered, and any other facts pertaining to the granting of certificates. The said Board have power to make by-laws for the full and proper execution of its duties under this act; to prescribe the forms and methods of application, examination and registration; to demand and receive from applicants the fees herein provided, which, which shall be held by the Board and applied to the payment of salaries and other necessary expenses incident to the full discharge of its duties.

SEC. 6. The salaries of said Board shall be $5 to each member for each day of actual service, and all legitimate expenses incurred in the discharge of official duties. The Secretary of said Board shall receive an additional salary, to be fixed by the Board, and not to exceed $500 per annum; he shall pay to the Treasurer at each meeting, or whenever the Board may direct, such funds of the Board as may be in his possession, and take the Treasurer's receipt therefor; provided, that no part of the salaries or expenses of the Board shall be paid out of the State treasury. In its annual reports to the Governor and the State Pharmacal Association, the Board shall render an account of all moneys received and disbursed, pursuant to this act; and the Secretary and Treasurer shall give such bonds as said Board shall from time to time direct.

SEC. 7. Every person seeking registration under this act, whose registration is not otherwise provided for, shall make application in form and manner prescribed by the Board, and deposit with the Secretary of the Board a fee of $5; then, on presenting himself at the time and place directed by the Board, and sustaining a satisfactory examination, he shall be granted an appropriate certificate setting forth his particular qualifications; provided, that in case of failure of applicant to pass a satisfactory examination, he shall be entitled to a second examination, without charge, at the next succeeding meeting of the Board.

SEC. 8. Every registered pharmacist, and every assistant pharmacist, in the meaning of this act, who desires to continue in the pursuit of pharmacy in this State, shall annually, after the expiration of the first year of registration, and on or before the second day of July of each year, pay to the Secretary of the Board of Pharmacy a renewal fee, to be fixed by the Board, but which shall not exceed $2, in return for which a renewal of registration shall be issued. If any person shall fail or neglect to procure his annual registration, as herein specified, notice of such failure having been mailed to his post-office address, as obtained from the books of the secretary, the Board may, after the expiration of thirty days following the issue of said notice, deprive him of his registration, and all other privileges of this act; in order to regain registration, it shall be necessary for such person to make application and pass examination, as provided in section 7 of this act.

SEC. 9. Every person registered under this act shall receive from the State Board an appropriate certificate, not exceeding in size 120 square inches, which shall be conspicuously displayed at all times in his place of business. If the holder be entitled to manage or conduct a pharmacy in this State for himself or another, the fact shall be set forth in the certificate.

SEC. 10. Any person who is not a registered pharmacist, in the meaning of this act, who shall keep a pharmacy, store, or shop for the compounding and dispensing of physicians' prescriptions, and who shall not have in his employ in said pharmacy, store or shop, a registered pharmacist, in the meaning of this act, shall for each and every offense be liable to a fine of $25.

SEC. 11. Any person who shall unlawfully and without authority under this act, take, use or exhibit the title of a registered pharmacist or assistant in the State of Colorado, shall be liable to a fine of $100, for each and every such offense; a like penalty shall attach to any assistant pharmacist who shall, without authority, take, use or exhibit the title of registered pharmacist in the State of Colorado.

SEC. 12. Any proprietor of a pharmacy, or other person who shall permit the com-

pounding of physicians' prescriptions, or the vending of drugs, medicines or pharmacal preparations in his store or place of business, except by a registered pharmacist, or assistant pharmacist, in the meaning of this act, or under the immediate supervision of one, or who, while continuing in the pursuit of pharmacy in the State of Colorado, shall fail or neglect to procure his annual registration, or any person who shall willfully make any false representations to procure for himself or for another registration under this act, or who shall violate any other provision of this act, shall for each and every offense be liable to a fine of $100; provided, that nothing in this act shall interfere with the business of those merchants who keep on sale such poisons, acids and chemicals as are regularly used in agriculture, mining and the arts, when kept and sold for such purposes only in sealed and plainly labeled packages: provided, also, that nothing in this act shall in any manner interfere with the business of any physician in regular practice, nor prevent him from supplying to his patients such articles as may to him seem proper, nor with the marketing and vending of proprietary or patent medicines, nor with the exclusive wholesale business of any dealers, except as hereinafter provided; provided, also, that nothing in this act shall in any manner interfere with the business of merchants in towns having less than five hundred (500) inhabitants, in which there is no licensed pharmacy, to sell or vend such mediciness, compounds and chemicals as are required by the general public, and in form and manner prescribed by the Board of Pharmacy.

SEC. 13. The proprietors of establishments other than pharmacies, and where physicians' prescriptions are not dispensed, as well as itinerant venders of merchandise, shall not be permitted to sell, keep on sale or give away any of the articles mentioned or included in schedule "A" of this act; nor any patent or proprietary preparation for medical, dietetic or toilet purposes, known to contain in large or small proportions any of such ingredients, nor any other chemical or pharmacal compound, the use of which, for a short or long period of time, might be attended with injury to health or morals, unless the container of said preparation, or the wrapper enclosing it, shall have affixed a "caution" label, such as the Board of Pharmacy shall devise and direct. It shall be the duty of the Board, when called upon, to furnish dealers with a list of such articles, preparations and compounds, the sale of which is prohibited or regulated by this section. Any person violating any of the provisions of this section, or evading any of the requirements herein imposed, or authorizing the same to be done by another, shall be liable to a fine of not less than one hundred dollars ($100) nor more than five hundred dollars ($500) for each and every offense; and any person who shall willfully make any false representation about the character or composition of any preparation or compound, with the object of deceiving the officers of the State, or defeating the purposes of this act, shall, for every such offense, be liable to a fine of not less than one hundred dollars ($100) or imprisonment in the county jail for not less than thirty days, or both. All suits brought on account of violation of any of the provisions of this act shall be prosecuted in the name of the people of Colorado, in any court of competent jurisdiction; and it shall be the duty of the district attorney where the offense is committed, to prosecute every person violating any provision of this act, upon proper complaint being made. All fines and penalties collected for such violation shall be paid to the State Board of Pharmacy, to be held by said Board as by this act required.

SEC. 14. All persons registered under the provisions of this act, and actively engaged in the practice of pharmacy, shall be exempt from serving as jurors.

SEC. 15. Annually on the first day of July of each year, the State Board of Pharmacy shall pay into the treasury of the Colorado State Pharmacal Association all moneys then held by said Board over and above the sum of three hundred dollars ($300), and which have been received by said Board as penalties for violations of this act, or as registration fees for the expiring year; provided, that the moneys thus paid to the State Pharmacal Association shall be held by said Association as a fund for educational and scientific purposes.

SEC. 16. An act entitled "An act regulating the practice of pharmacy, licensing persons to carry on such practice, and exempting them from jury duty; providing for the appointment, and prescribing the powers and duties of a Board of Pharmacists," approved April 2, 1887, and all acts and parts of acts in conflict with the provisions of this act, are hereby repealed.

SEC. 17. Schedule "A." Aconite, belladonna, conium, henbane, nux vomica, opium, ergot, cantharides, digitalis and ipecacuanha and their preparations, alkaloids and other derivatives, morphine, strychnine, codeine, cocaine, and all other alkaloids and their salts, chloral, chloroform, ether, oil tansy, oil pennyroyal and all other hypnotics, ecbolics and emmenagogue agents, mercury, copper, antimony, zinc, iron, lead, gold, arsenic and silver, their salts and compounds. All cyanides, iodides, bromides.

SEC. 18. In the opinion of the General Assembly an emergency exists; therefore, this act shall take effect and be in force from and after its passage.

Passed the House of Representatives March 28, 1893; passed the Senate April 1, 1893.

Approved April 17, 1893.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

THURSDAY EVENING, AUGUST 17.

The Section was called to order at 8 p. m. by W. H. Torbert, Chairman of the Section. In the absence of the Secretary, Arthur Bassett, of Detroit, Mrs. Mary O. Miner, of Hiawatha, Kansas, was selected as Secretary *pro tem.*

The Chairman read the following address:

Gentlemen: The paramount commercial interests of pharmacists at the present time would seem to be involved in such questions as these: "What shall we have for a currency? Shall it be gold or silver, or both? Shall the Sherman purchase feature be repealed? What is the panacea for the panic, and how may the pharmacists in these stringent financial times get money to meet their engagements?" To consider other evils in the presence of these overshadowing questions seems neglecting the greater to consider the less; but, I take it, it is not in the province of the Commercial Section to treat those ills which are national in their character and apply to each and every interest alike, and which would be powerless for the Commercial Section to redress. There are many questions and conditions which affect the commercial interests of pharmacists; and, no doubt, these will be considered by you by papers, or in discussions, and each and every question will be properly considered by this Section.

As you are doubtless aware, by the action of the Proprietors' Association and the National Wholesale Druggists' Association at Montreal, the execution of the American Pharmaceutical Association plan, as set forth in the recommendation to the officers and members of the Interstate Retail Druggists' League, intrusted to the League the entire supervision and execution of the American Pharmaceutical Association plan. I am pleased to state to you that the American Pharmaceutical Association plan, without material or essential change, is the basis of those recommendations. I congratulate the American Pharmaceutical Association that the supervision and execution of the plan, of which it is a parent, is intrusted to so aggressive and vigorous a body as the Interstate Retail Druggists' League, whose newly-elected President is an honored member of the American Pharmaceutical Association, which is organized strictly and only with reference to the particular interests of pharmacists which are involved in said plan. Therefore, the Commercial Section has been relieved entirely of responsibility in the execution and supervision of the plan. This arrangement was consented to and approved by your delegates to the Montreal meeting; and their action has the cordial approval of the Chair-

man of this Section. and so far as I know, of the general membership of the Association. But with this relinquishment of personal and special supervision, it seems to your Chairman that it would be proper for this Association to make such suggestions and recommendations to the officers of the Interstate League, and offer them such assistance, in suggestions and otherwise, as this Section may deem expedient. Particularly should it be understood everywhere that this Association and Section is in entire sympathy with the object and the purpose and the interests of the League; and in all its just and proper endeavors to protect the interests of retail pharmacists, it will at all times gladly assist.

The details adopted for the execution of the American Pharmaceutical Association plan at Montreal absolutely leave the execution of the American Pharmaceutical Association plan entirely in the hands of the Proprietors' Association and the Interstate League. The American Pharmaceutical Association has thus consented, through the action of its representatives at Montreal, to leave the entire matter in the hands of the Interstate League, recognizing that the League with the Proprietors is the agency which shall execute the American Pharmaceutical Association plan and lead the pharmacists of this country into a large and wealthy place. In the process of the execution of the American Pharmaceutical Association plan there came a singular and anomalous condition with reference to its enforcement; the facts of which I will briefly recapitulate.

Under the provisions of the plan, all cutting pharmacists, in any city in which fifty per cent. of the entire number of pharmacists were organized in the League, were to be put on the cut-off list, provided the fact was certified to by three local members of the League, by the Secretary of the League, and by a member of the National Wholesale Druggists' Association. In the city of Chicago these conditions were all fulfilled; but the sub-committee on proprietary articles of the National Wholesale Druggists' Association held that where pharmacists were cutting in self-defense, said pharmacists ought not to be denied their supplies. Of course, this conception practically vitiates and destroys any virtue the American Pharmaceutical Association plan may have, if this construction of the sub-committee is upheld. Therefore, your Chairman would recommend that the American Pharmaceutical Association declare itself unequivocally on this subject, and send a delegation to the meeting of the National Wholesale Druggists' Association at Detroit, to co-operate with the officers of the Interstate Retail Druggists' League in securing the execution of the American Pharmaceutical Association plan in accordance with the provisions, conditions, terms and recommendations as set forth in the action of the Proprietors' Association at Montreal, and also the action of the National Wholesale Druggists' Association.

I cannot conclude these opening remarks without congratulating the American Pharmaceutical Association on the increasing interest in this Section; and I believe that the increasing numbers of pharmacists are constantly being drawn into the Association owing to the fact that the Association is not only promoting the interests of pharmacy in its scientific aspects, and constantly exalting its educational and legislative standards, but is in every way endeavoring to promote the practical and commercial interests of pharmacists.

I trust that each and every member of this Association will not only attend the meetings and discussions of this Section, but will prepare papers on any subjects of special interest which may occur to them, and in this way widen the interest and usefulness of this Section.

Thanking you for the honor of having twice made me the Chairman of this Section, I await your further pleasure.

A motion was made to refer the address to a committee of three to consider the recommendations made therein, and report before adjournment but the chair said that as there would be only one session of the Section,

he would waive parliamentary law and suggest that the matters be taken up and discussed by the members present.

MR. JAMIESON: It will facilitate matters if the Chair brings up for discussion such matters as will be of interest to the Section and thus dispose of them at once.

THE CHAIRMAN: That will probably be the most expeditious method of procedure. Of course, I have stated in my address the facts in reference to the A. P. A. Plan. The recommendation your chairman made is a matter for discussion, that is, whether your view is in accordance with that of the chairman in regard to the decision of the subcommittee of the National Wholesale Druggists' Association of which Mr. Kline is chairman. And I may add that there are two other members, namely, Dr. Pierce, of Buffalo, and Mr. Bigelow, of Lowell. I understood from Dr. Pierce, whom I met in Chicago while attending the meeting of the Interstate Druggists' League, that they discussed at that meeting the question of whether or not those druggists of Chicago who had been put on the cut-off list, in compliance with the provisions of the plan, should be restored. That plan, remember, is the one which has been accepted by the representatives of this Association and agreed to by the manufacturers represented by the National Wholesale Druggists' Association. Now, I think it must be obvious, and require no argument to show that the plan is absolutely a nullity if this construction is allowed to hold good and is sustained by the National Wholesale Druggists' Association and the Proprietors' Association—that any pharmacist who sets up the plea that he is cutting in self-defence will be permitted to do so, and is neither to be put on the cut-off list nor denied his supplies. If that is the decision, then we have no plan, but are simply spending our time and substance over that which is of no account; and I think the quicker we discover whether what those gentemen promised the representatives of this Association at Montreal is what they really meant, the better it will be for this Association and for the Druggists' League, which has now, by the concurrence of our representatives at Montreal, been given entire charge of the matter.

The recommendation in the address was that this Association should speak out emphatically on that particular point, and I shall be very glad to hear the subject discussed. There are gentlemen here, the representatives of Chicago, who took a very active interest in supporting the League here; they had in it over 50 per cent. of the entire number of pharmacists of this city, and every part of the agreement set forth in St. Paul was accepted by the branch League in Chicago. Nevertheless, the fact is notorious that the work of cutting still goes on here, and has never been checked for a single moment.

MR. JAMIESON: On behalf of the druggists of Chicago here, who are indicted by this charge, I would say this, that at the time when the store which is known as the "Chemical" was threatened, there had been no cutting in Chicago, which was the only city, I believe, of any considerable magnitude where cutting did not exist. The proprietors, at their last meeting, promised the retail trade, through the League, that they would do everything in their power to prevent cutters from obtaining supplies; but Mr. McConnell went to New York and obtained a supply of drugs to the extent of from fifty to seventy-five thousand dollars, apparently without any effort. The dealers were all warned beforehand as to what he was going to do; he was going to bring those goods to Chicago in order to start cutting here and bring the fight right upon us, where we had previously had no trouble of the kind. Now, I claim, in behalf of the Chicago druggists, that if the proprietors had meant what they said, or if they had intended to carry out their promises, Mr. McConnell should never have received one dollar's worth of those goods. In spite of this, he obtained a full supply from every manufacturer in this country, although not directly, but evidently they were unable to prevent him, as a cutter, from getting his supply. While knowing beforehand that he was going to use his goods for the purpose

of cutting, they were unable to protect the trade of Chicago against this cutter. The trade of Chicago protected themselves—that is, those immediately interested protected themselves in the best way possible, namely, by meeting the cut prices. They did not adopt this method, however, until they found that no relief whatever was obtainable from the manufacturers. The cutting did not commence here until some time after the Chemical store was started, and was injuring the local trade. Therefore, I believe the Chicago druggists were perfectly justified in retaliating, and I think the Chair does them an injustice in making the statement that he has made, to the effect that the action of the Chicago druggists will nullify the American Pharmaceutical Association plan.

THE CHAIRMAN: It seems to me that the gentleman did not quite understand my statement. In the written address I did not cast any reflection whatever on the Chicago druggists, and I did not understand, at the time, that they were out of sympathy with the steps which we were undertaking with reference to permitting Mr. McConnell, as well as themselves, to get supplies. The reflection we make is not upon the individuals, but on the conclusion they reached. Of course, we may differ with a man's judgment, but at the same time have profound respect for the man himself. It is not always that we think alike. My remarks were more particularly directed to the sub-committee of the Proprietors' Association, and not to the men, but to their conclusion. I have had very cordial and intimate relations with that sub-committee, and Mr. Kline, its Chairman, is my warm personal friend, as I am his. But I think the argument which he makes for his people and the conclusion he reached is altogether wrong. At the same time, I did not, for a single moment, intend in my address to cast any reflection upon any of the pharmacists of Chicago, and no such inference can be drawn from it. I have been too frequently a recipient of their hospitality and kindness to be discourteous and to reflect upon them. I understand that when these events occurred which led up to their being placed on the cut-off list by the Interstate League, some of the druggists—I don't know but all—were in sympathy with the arrangement, or wished to make a test of the American Pharmaceutical Association plan, and this covenant made at Montreal, to see whether it contained anything of value; and if perchance it should occur, in the development and execution of the plan, according to the letter and spirit of the contract, that it would not only preclude their obtaining supplies, but would prevent any cutter anywhere from getting them from any point, it would thus attain the result they so much desired.

MR. JAMIESON: In so far as you charge the committee, Mr. Chairman, with upholding the druggists of Chicago who were cutting in self-defence, I would say that they upheld the druggists who protected themselves.

THE CHAIRMAN: That is not the case, I think. It may be in effect, but the fact should rather be stated in this way, if I may make it clear: The American Pharmaceutical Association plan at Montreal was put into the hands of the Interstate League, to be enforced under certain conditions, namely, that branch leagues should be formed, and whenever a branch was made up of fifty per cent. of the local pharmacists, if any one were to cut (no matter whether a pharmacist or the proprietor of any other kind of a store) and the fact were certified to by the Secretary of the League and by a member of the National Wholesale Druggists' Association, then such cutter, whether cutting in self-defense or for any other purpose, was to be put on the cut-off list issued by Mr. Kline. These cutters were then to be denied their supplies not only from jobbers in Chicago, but also from distributors of goods in New York. If the plan had been carried out strictly to the letter, it would have been impossible for Mr. McConnell to have obtained his supplies in New York.

MR. JAMIESON: Right there is the point. It is not a question of policy, but as to the

proper thing to do. If the druggists of Chicago were nor protected from opposition without, there was no protection. There was no opposition from within, no intention of cutting in Chicago, no thought of it; in fact, every member who is now cutting had declined to do so. That is the way the cutting existed, solely for self-protection. The druggists are in hearty sympathy with the League (and I desire to emphasize this fact), provided the manufacturers will stand up to their agreement not to sell to cutters. But when the druggists cannot receive any protection from the manufacturers, then they must use the best means they can find to protect themselves; and this they have done, and for that I do not think they ought to be condemned. If the cutting had commenced among themselves, it would have been a different matter; but the cutting was entirely from without being created by interests outside of Chicago, and for that reason I do not think the druggists should be condemned for doing what every one does, namely, protecting their own interests.

THE CHAIRMAN: I should regret very much if, in this Section, we were to proceed with a discussion of this question on the line of whether or not the Chicago pharmacists were to be censured. Now, I do not think that that aspect should appear in the discussion at all. The Association inaugurated a plan at New Orleans, re-affirmed it at the White Mountains, and sent representatives to Montreal to bring it to the attention of the National Wholesale Druggists' Association. It was there confirmed, and certain conditions were provided for its execution. Now, the question is not whether the pharmacists of Chicago or elsewhere are to be censured. The matter which we want to discuss, it seems to me, is whether the American Pharmaceutical Association plan has anything in it of virtue, if it is to transpire that a cutting pharmacist, in any community, for any consideration, shall be permitted to get his supplies and not be put on the cut-off list, when such pharmacist sets up the plea that he is cutting to protect himself. Why, my friends, you know very well that that absolutely excuses and justifies all cutting, because no man cuts without being able to affirm that it is done in self-defence. He wants to secure more business, to promote his own interests, and therefore he cuts. For this reason I hope that in the discussion of the question you will confine it within its legitimate boundaries and keep to the point, namely, whether or not the American Pharmaceutical Association plan as enacted at Montreal is of any value, if this construction of the sub-committee, of which Mr. Kline is Chairman, is correct.

MR. MARTIN: I most certainly take exception to the remarks made by Mr. Jamieson, to the effect that until Mr. McConnell's advent there had been no cutting in Chicago. I claim that there was no more reason for making cut prices after Mr. McConnell's opposition than there was before. If there was reason before, then there was reason afterwards; but if there was no reason previously, then there was no reason aftewards. Now, I claim that every department store in the city of Chicago, of any size whatever, cut on patent medicines previous to the advent of Mr. McConnell, and I defy any one to prove to the contrary. It is also a well-known fact that two of those department stores had full-fledged prescription departments and a third one was in course of establishment! Then why did our brethren of the Interstate League, upon the advent of Mr. McConnel. in the midst of the battle, change front and take fright? I claim that the only instance where cutting might have been excused would have been in patent medicines, for the simple reason that the public had long known that when they want a bottle of sarsaparilla—Hood's Sarsaparilla or any other—they can get it at the drug store, and it is supposed to be one and the same thing wherever they get it. But when these druggists enter into cutting on everything else in the drug trade, such as quinine pills, or quinine and iron, which is prepared by from fifty to a hundred different manufacturers and the processes are different, then I say they exceed their position and their proper rights, if they have any regard whatever for their brethren in business. Mr. Jamieson certainly knows

that that is a fact, for we had been trying to fight the evil of cutting on patent medicines for years previous to Mr. McConnell's advent. All I asked at the time, as chairman of the executive committee of the Chicago League and as executive committeeman of the State of Illinois, was for those men to hold off and give the League a chance; but they expected the impossible to be performed, and supposed that a difficulty of this magnitude could be overcome in the period of two or three months, although it had been attempted for ten or twelve years past without success. To that extent, I say, our Chicago brethren should certainly be censured. I should not have blamed them had they made the break in patent medicines, but when they cut into the marrow of the drug trade and met prices, then I say they did a very wrong thing.

MR. BODEMANN: I take it that the Chicago cutting question is not on trial so much as the Interstate League, and it is on that point I wish to speak. The whole matter is a theoretical problem thus far, and we are therefore obliged to treat it as a theory. If the Interstate League is to be anything more than a theory, Mr. Kline's action knocks it on the head; and if he is to be sustained at the Detroit meeting of the National Wholesale Druggists' Association in October, then we had better hold a coroner's inquest and get ready for the funeral. There is no other way of drawing the line except to recognize that cutting is cutting, and by any name it is just as sweet. There is no such thing as cutting in self-defence. Who is cutting for any other reason than self-defence? If the expounder of our interests were the Proprietors' Association, and it is maintained that cutting for self-defence is a good excuse, then we had better know it at once, for everybody is cutting for self-defence, and not for profit. When we send our representatives to the meeting of the National Wholesale Druggists' Association at Detroit, we ought to follow a very different tack from what has been suggested in the chairman's address. I don't believe that it is wise to drop the whole plan out of our hands and entrust it to the Interstate League, for the simple reason that I believe the Interstate League is a fossil. It doesn't do us any harm to look at the matter squarely. How many States have yet succeeded in establishing branches? Only one, I believe, has thus far succeeded in doing so. In Chicago we have been unable to establish a branch. Five of our members have signed the pledge, but we haven't a branch yet, after waiting five years for one. Now, according to the chairman's statement, we are going to drop the American Pharmaceutical Association plan out of our hands and entrust it to the Interstate League. And what is the Interstate League? It has only one branch and that is at Minneapolis. There are no branches in Chicago, St. Louis or Kansas City. For this reason, if we let the plan go out of our hands and entrust it to the League, we might as well drop it altogether. I would therefore make a motion to the effect that our delegates to the National Wholesale Druggists' Association at the Detroit meeting receive specific instructions so that they will know how to address the wholesalers and proprietors. If Mr. Kline is to be maintained, then we have got the game in our own hands and leave the wholesalers and proprietors out of it altogether; if not, we can make a different bargain. But at present the Interstate League is not a local body and it can make no terms. Chicago has no branch, and I don't know of any State except Massachusesetts that has a branch. The Interstate League does not recognize Chicago, and for that reason the League cannot present any proposition to the National Wholesale Druggists' Association.

THE CHAIRMAN: I believe that I am more familiar with the history of this matter than any one else present, and may therefore take a different view of it from that expressed by Mr. Bodemann. It seems to me that the motion he suggests would be out of order, as he will probably concede when I state the situation. This Association sent representatives to Montreal, who were authorized to act for this Association; they were clothed with its power, and they acted. Mr. Ebert was a member of that committee, and I regret that he is not here to make a statement with regard to its work. In the conference

of this committee with the National Wholesale Druggists' Association, the question was discussed whether the American Pharmaceutical Association or the Interstate League should be the custodian of the plan. In the discussion, a gentleman connected with the pharmaceutical press thought that it would be well to put this plan in the hands of the Interstate League, which had been organized in St. Louis for the specific purpose of taking care of this cut-rate problem. Now, then, this Association, through its representatives, consented to make this arrangement, and therefore it is manifestly improper for this Association to suddenly abrogate the action which its representatives took.

I do not agree with Mr. Bodemann's second proposition, that the League is a theory. As a matter of fact, it is a great undertaking to organize this country into Leagues and Associations such as it contemplates, but very much has been done. I think I can truthfully state that in a great many localities where branches have been established, the League is in successful operation, and I think it would work well in Chicago if the principles involved in the plan, which the League is entrusted to execute, were carried out. But the fact of the matter is that when the plan came back to this sub-committee (and we might as well be plain on this point) they, by their report, absolutely took out all the virtue there was in it, so that the plan, with their construction of it, was not worth the paper it was written on.

Now, what I contemplated in my address was, that this Association should declare that the arrangement made at Montreal between the proprietors, the wholesalers and this Association through its representatives, should be adhered to and should be carried out. Their action has prevented this, for in the very first case which came up to determine the value of the plan, for which we have been struggling for two or three years past, they met us at the threshold with the decision that whenever a man cuts in self-defence, nothing can be done. The American Pharmaceutical Association plan was designed to prevent cutting, and provided that when a druggist cut—no matter for what reason—he should be put on the cut-off list and should be denied his supplies. When the American Pharmaceutical Association plan enforces that provision, it effects what it was intended to effect, and this Association has a right to insist on its enforcement by demanding what is a fair and just consideration of the plan. The National Wholesale Druggists' Association and the Proprietors' Association ought to be willing to concede this and consent to carry out their agreement.

MR. ALPERS: Are we to infer from the remarks made by our respected Chairman that any motion which is not in accordance with the recommendations contained in his address will be declared out of order?

THE CHAIRMAN: No, sir. The idea I intended to convey is this, that the American Pharmaceutical Association had absolutely, forever and beyond recall, put the execution of the American Pharmaceutical Association plan out of its hands, because it agreed, in specific form and terms, at Montreal, that the Interstate League should be its custodian and should be responsible for its execution. I distinctly said in my address that we should appoint a committee to go to the Detroit meeting to coöperate with the League, to the end that the National Wholesale Druggists' Association and the Proprietors' Association shall carry out the agreement which was made at Montreal.

MR. ALPERS: My views on this American Pharmaceutical Association plan are well known to those who attended our meeting in the White Mountains last year. I believe that the American Pharmaceutical Association plan, or any other plan for regulating prices, is founded on a wrong basis. In the first place, such a plan is impracticable, and instead of remedying the evil, it actually makes it worse. Again, such a plan implies a boycott; for you either boycott the manufacturer, whose business is just as legitimate as your own, and who has invested large sums of money from which he

expects a return, or you boycott the jobber, the wholesaler, who has to struggle just as hard for existence, in certain places, as we have. Sometimes the wholesalers are rich men, and in that case they are as fairly entitled to their earnings and the profits of their enterprise as we are. If you do not boycott these men, you may boycott a number of druggists because they differ from you as to the way in which the drug business should be conducted. Because they do not assent to what you propose, are they to be boycotted? The boycott, wherever it is practiced, is a despicable business; it is wrong in conception and in execution, and wherever it is tried it deserves to utterly fail. You may pass as many resolutions as you like, but you cannot stop this cutting. You have not been able to stop it thus far, and you will not be able to do so in the future. Last year, in the White Mountains, I told you this same story, and prophesied to what an extent cutting would eventually reach in Chicago, but the Chicagoans laughed at me and repudiated my views. "Why, you are a New Yorker," they said, "living in the effete East, and don't know anything about our Western style of doing business. We know how to conduct our business, and can keep the cutters out of Chicago." The same thing was said by Mr. Alexander, of St. Louis, who was positive there would be no cutting in St. Louis as long as he lived. What has been the result? In St. Louis they are trying to cut each other's throats, just as they have been doing for some months past in Chicago. The fact of the matter is, you cannot stop this evil, because your side is unpopular with the public, and the greatest support the druggist receives comes from the public. It is not with the manufacturer nor with the jobber that you should make contracts, but with the public, if you want to succeed in business. You are here like a lot of political bosses who meet together and appoint candidates for office and arrange which man shall be voted for. In formulating these plans you imitate this procedure, afterwards compare notes, and decide that it is all right so long as the public does not know. But as soon as you are found out you will be buried under opposing votes, and the public will bury all your contracts every time you make them. The cutters will print copies of your agreements and post them up over their own doors. They will say, "Just see what these fellows do. They want to charge the public high prices, while we are ready to sell the same goods cheap." The fact of it is, that in selling patent medicines there is no question of fact to be considered nor any question of ability. You do no more work in selling Hood's Sarsaparilla than a grocer's boy in selling butter—hardly so much, for he weighs the butter, while you merely hand out the patent medicine. It is the lowest kind of mercantile transaction that you can engage in, and the profit that you expect to get for these nostrums, ranging from fifty to a hundred per cent., is not in proportion to the work you do. This is the principal reason why you cannot maintain high prices. The patent medicine manufacturers have enabled you to get these prices by not putting a low price on the bottles, thereby expecting to get your endorsement of their goods. The druggists have endorsed these nostrums for many years past. They have said, "This one is good" and "That one is good," and in this way have induced the public to believe in the good qualities of the patent medicine. Time has passed, and we now have to suffer for the sins of our fathers in pharmacy. But it is only a natural result, and what might have been expected. If the pharmacists of this country, some thirty or fifty years ago, when patent medicines first began to increase in number, had taken a bold stand against them, we would not now be overrun with them. To-day they are here, and will stay and be sold at cut prices. You will never again be able to get full prices for these goods in Chicago or anywhere else, no matter what you do, and no matter if all the druggists combine together to fight for them. The time when rates could be maintained has passed, and it will never return.

THE CHAIRMAN: I would like to inquire whether you keep patent medicines in your store, and sell them at cut prices?

MR. ALPERS: I sell them at as low a price as circumstances require.

In the discussion of this question there has been one great mistake made. You have

divided the subject into two sides. On the one is the full price and on the other the cutter, who is a very wicked man. By the term "cutter" I presume you intend to describe the dealer who sells all proprietary goods at nearly cost price, buying them at the jobber's price and making a sufficient profit to be enabled to run his store. He does not sell them at *his* cost price, but makes enough profit on them to pay the expenses of his store, perhaps more. Now, between the two sides of the matter there is a third point worthy of attention. Why not consider the patent medicine or proprietary article in the same way in which you would regard a tooth-brush or a cigar, and sell it for whatever price the public is willing to pay for it, which is the fair price? Everybody knows what in his own locality constitutes a fair price. If you can get 75 cents, take it; if you can get 50 cents, take it; but don't expect to be able to restore the full prices again. In place of that, endeavor, as far as possible, to put up your own goods and recommend them instead of the patent medicines. This you will find to be a very profitable transaction. When this matter of rate-cutting first arose in New York and vicinity, I, being in a suburb of New York, fought against it just as you do. I wondered if I sold those nostrums at much less than the full prices, where my profit would come in, and how I could make a living; but I gradually met the competition and was finally convinced that it paid me better to do so. I then put up my own goods, pushed them as much as possible, keeping very strict account of all my transactions, and to-day I know that my net profit from my sales is larger than it ever was when I got full prices for the patent medicines. This success will be yours whenever you learn the value of putting up your own goods, and appreciate the benefit arising from properly recommending your own goods.

Now, Mr. Chairman, for the purpose of bringing this question squarely before the Section, I desire to offer the following resolution:

Resolved, That although custom compels us to handle and sell such articles as are commonly known by the name of patent medicines, the ingredients of which are unknown to us and the public, yet—

MR. BODEMANN: I would suggest that my motion is in order.

THE CHAIRMAN: I hope you will modify it as suggested, and state something to this effect, "That this Section send a committee to Detroit to co-operate with the Interstate League and insist that the American Pharmaceutical Association plan be upheld by the Proprietors' and the National Wholesale Druggists' Association."

This motion is very important, because it is necessary that the Association should not infringe on the work of the Interstate League. That body has taken up this matter, and the plan is in its hands. It is concluded that we cannot do any retroactive work except as Mr. Bodemann suggests, to send a committee to Detroit to co-operate with the Interstate League in securing the enforcement of the American Pharmaceutical Association plan as set forth in the proceedings of the National Wholesale Druggists' Association at Montreal.

MR. BODEMANN: I assent to the suggestion offered by the Chair, and will amend my motion, making it as follows: "That a committee be sent to Detroit which shall coöperate with the Interstate League and insist on the execution of the American Pharmaceutical Association plan as agreed to at Montreal."

THE CHAIRMAN: If it is satisfactory to Mr. Alpers to introduce his resolution later, when it will not interfere with the discussion of the question properly before the house, I hope that he will do so.

MR. ALPERS: I am willing to do this, and will offer it later, as the Chair suggests.

THE CHAIRMAN: Remarks on Mr. Bodemann's motion are now in order.

MR. ROGERS: I am very much surprised to hear members of this Association state that they cannot control this cut-rate evil in their own towns. Now, I represent a little village in Kentucky having a population of over 200,000, and yet we manage to control matters down there. We have everything just as we want it, but we went to work in the right way to obtain this desirable state of affairs. We had confidence in one another, and exhibited some brotherly love. I was a delegate to the New Orleans meeting, and after attending that meeting I returned home, met our State Association, and frankly made my report. The Association thereupon unanimously adopted the American Pharmaceutical Association plan. At this time the Louisville Botanical Club was started. Louisville had formerly been a cutting town, but coöperation was finally introduced, and we put our shoulders to the wheel and pushed. We got every druggist in Louisville to sign the articles with but one exception, and he was so insignificant that we let him alone. To-day, there is not a store in Louisville that cuts, nor is there a store which recommends patent medicines. In my store you will not see any patent medicines at all. They are behind a case, and you have to ask for them before you get them. Patent medicines are not recommended at my establishment. There is no cutting in Louisville, and we get full prices. It is only through the lack of coöperation on the part of druggists in other cities that the same desirable result is not achieved. If you will abandon selfish ideas and look to one another's interests, you can accomplish anything.

MR. STEDEM: The theory of the gentleman from Louisville is a sound one, and his scheme is practicable so long as the dry goods people do not go into the medicine business. I have had some experience in Philadelphia. My store is mid-way between the establishment of the original Philadelphia cutter and his notorious imitator, neither of whom are pharmacists.

MR. ROGERS: In Louisville a dry goods store attempted to carry patent medicines at one time, but we combined our forces, and having raised from five to ten thousand dollars to oppose any store which does any cutting, we decided to spend this entire fund, if necessary, in order to open a store on the next corner and sell goods at cost. The dry goods people fortunately decided not to engage in the drug business, but if they had we should have carried our threat into execution, even if we had lost money by it. I will further state, the Louisville Botanical Club paid the requisite dues to the Interstate League, and is now a branch of that organization.

Mr. Bodemann's motion having been duly seconded, was now put to a vote and was carried.

THE CHAIRMAN: Mr. Alpers' resolution will now be in order.

MR. ALPERS: The resolution I desire to present is as follows:

"*Resolved:* That although custom compels us to sell and handle such articles as are commonly known as patent medicines, the ingredients of which are unknown to us and the public, yet as professional men we condemn them as unscientific and directly opposed to legitimate pharmacy; therefore, be it further

"*Resolved*, That we recommend to all pharmacists to discourage the use of such unscientific preparations, and in their places to offer and sell preparations compounded by themselves, in their own laboratories; and

"*Resolved*, That we disapprove of all plans upon contracts to regulate the prices of such unscientific articles as useless and detrimental to legitimate pharmacy."

In explanation of this resolution, I will say that there are really two resolutions presented. I separated them purposely, because I believe there are some people who may favor the first and not the second part, an opinion in which I have been confirmed since

attending this meeting. If it is in accordance with the views of the majority, I am willing to divide the two parts of my resolution, so that they may be voted on separately.

THE CHAIRMAN: Of course, these resolutions will have to be acted upon separately, and we will therefore take up the first part:

"*Resolved*, That we recommend to all pharmacists to discourage the use of all such unscientific preparations, and in their places to offer and sell preparations compounded by themselves in their own laboratories."

MR. MARTIN: May I ask the author of the resolution this question: If he calls Hood's Sarsaparilla and Bull's Cough Syrup unscientific preparations; would he call Mr. Alpers' Sarsaparilla and Alpers' Cough Syrup scientific preparations? or is it only one patent medicine manufacturer against another?

MR. ALPERS: The reason why I should call Hood's Sarsaparilla and Bull's Cough Syrup unscientific preparations would be because we do not know what they contain. Such medicines are claimed to be cures for everything. If you look at Hood's wrapper, you will find that he recommends it as a remedy for any disease you can think of. This certainly stamps it as a fraud. I can't understand how a man can have the audacity to put up a remedy and make such claims for it, although it has been done from time immemorial. I may have an excellent medicine for treating a cold under certain conditions, but if I claim that the same medicine will cure corns, I leave the paths of legitimate pharmacy and become a humbug, for I know it can't be done. Therefore, I believe the preparation compounded by myself, whether I compound it the moment it is called for or compound it beforehand for a certain emergency, is perfectly within the sphere of legitimate pharmacy. It is certainly far different to handling a nostrum which is claimed to be good for everything, from corns to Bright's disease.

MR. BODEMANN: If we adopt this resolution, we officially declare that we are quacks practicing medicine without licenses, and can be arrested and put in jail, because you have no right to suggest remedies without having a license to practice medicine.

MR. SEABURY: I am very glad that Mr. Alpers has precipitated the pessimistic part of pharmacy. I have always been an optimist, and always will be. I have always been found standing up for what I believed to be just and right in the practice of pharmacy. A speech, such as the gentleman from New Jersey has just made, I should expect from Mr. Reicker, or any of the original scalpers or cutters in this country. But I question the right of any man when speaking of these "advertised nostrums," as he terms them, to denounce all of them as frauds and humbugs. Some of them may be ten times better than the goods that he puts up. I am not a pleader for patent medicines; I think that ninety per cent. of them ought to be thrown into the lake; but there is ten per cent. of them which are made and advertised by men of honor, who have graduated in pharmacy, and who understand medicines just as well as any man who believes in scientific medication. These men have simply done just a little more than the speaker has done. While he confines his operations to his little town in New Jersey, another man has taken in a larger territory, and has done nothing more nor less than he has done, but only on a greater scale. It does not follow that we are to debase ourselves by cutting prices in order to increase our own trade.

What has scalping ever done for us in scalping communities? Why, it has debased nearly every article we handle, and I speak from my own knowledge. I have stated this in our meetings time and again. I have never yet had a man possessing such convictions as those expressed by the gentleman from New Jersey, come to me for the purpose of getting a first-class article. They always want the worst and cheapest stuff that we can put up. This is the truth, and I have facts to prove my assertion. Now, sir, this

statement that we have got to be forced into the menial position of tradesmen clear through, is something which I most emphatically deny. The gentleman must remember that there are eighty per cent. of the druggists in this country who have no views of that kind to combat. Why? Because there flow through their hearts a few drops of the precious blood of brotherhood, as our friend from Louisville has so well stated, and they have interests in common. I know plenty of communities where there is no cutting to-day. Occasionally some fellow breaks out with the disease, but the rest go to him and say, "We will either kill or cure you." He says, "I want to live." "All right," they reply, "Come and join our band," and a resurrection takes place. The great trouble with this so-called commercial gospel of emancipation from thraldom, which a few men have precipitated us into in the past and still continue, is, as the chairman has suggested, that it has made too many freemen, too many cutters. I have taken the same ground in Brooklyn. When we had cutting there, I asserted that the best way in is always the best way out. Instead of an Association of two or three hundred resolving to cut and meet the cutter, I have always taken the ground, and I still do so, that it is a great deal better to fight the few cutters, and let everybody else stand firm for full prices. If you do so, you can make the manufacturer of patent medicines honest, and make the jobber honest also. That is the easiest way out of this dilemma. If, on the other hand, you meet cut with cut, you will never see daylight; and to that extent I agree with Mr. Alpers, for when everybody cuts there is no reclamation. Once enter upon that course and you can never restore the good old times; but if you organize and stand together, even if there is only fifty per cent. of you at first, you can eventually increase your strength until you will be able to control the cutting department stores and the jobbers who supply these people.

Now, I have made a special study of this subject for many years past. I did not expect, to-night, to say a word; but when Mr. Alpers brought forward the old, familiar chestnut, that we can never protect ourselves, and undertook to explode a pessimistic bomb-shell in the midst of our camp, I thought I might just as well say a few words in defence of those principles which I have always maintained and always intend to uphold. I care not what others may do, but for my part no scalper, no department store, nor any other cutter, shall ever get a dollar's worth of the articles I manufacture, and this assertion I wish to emphasize now, so that no one shall fail to understand it.

MR. STEDEM: I can prove that Mr. Seabury is mistaken with respect to his goods not getting into the hands of cutters.

MR. SEABURY: I believe I can explain to your satisfaction how that has happened. When we went into the Campion plan, we were in very good shape. We would have come out all right, and would not have had a cutter to-day possibly, if the crusade had been properly managed. If this had been done, you would not have found a department store carrying a single patent medicine of any kind. Unfortunately the rapacity of some jobbers caused the Campion plan to fail, and we meet with this same difficulty to-day. I have been greatly disliked by some of these gentlemen, and I am proud of it, and every time I get a chance to retaliate on these friends of the cutter I am glad to do so. Not more than two or three weeks ago I was at a meeting of proprietors and jobbers. There was a great deal of plain talking indulged in, and every one present admitted that there was only one reason why we cannot regulate prices, and that is because we are prevented by the distributor. He is the Mr. Hyde. On the other hand, I know that all the manufacturers on the contract plan are honest and can be trusted. Now, sir, what has been said by both sides here is correct. You can get as much of my goods as you want, and I cannot prevent it. There are too many jobbers whom we believe to be honest, who will sign contracts with one hand and pass over the goods to the cutter with the other. I have traced my goods in such cases, know who the men are who break their agree-

ments, and it is with them that the whole trouble lies. The distributer is to blame. He is the man who is defeating his own customers, and it has been so for years, and ever since the Campion plan was in operation. It has been said that the manufacturer is selling goods to the department store and the scalper. My friend Eccles asked me at the last meeting how it was that he could find my goods in the cutters' stores. I repeat that I do not sell them, for they cannot get a dollar's worth or a dozen lot of my goods direct from my establishment.

A MEMBER: I would ask Mr. Seabury this question: Could you not, if you were so disposed, find out which of the jobbers sell to cutters, and thus be enabled to prevent them from getting any more goods in future?

MR. SEABURY: I will do that every time. It is always my practice to cut off the supplies from such jobbers whenever I catch them giving aid to cutters.

MR. STEDEM: Have you caught many?

MR. SEABURY: Yes, several; but although they do not get the goods from me, they sell them just the same, and that is exactly where the trouble lies. There is one man whom I cut off the list, and that I have more respect for than any other member of the jobbing trade, for the reason that he makes no secret of his operations. He could not get any goods from the house direct, but at the same time he said to me: "Walk into my establishment, and I will show you enough of your goods to supply all the cutters in town. Where do I get them? Oh, you know where I get them. There is always some retailer willing to supply them." Now, that is the point, and you must not forget that a jobber is able to get six gross from another jobber and three gross from Tom, Dick and Harry. In that way our own people defeat us. You can talk about the perniciousness of the boycott, but I tell you it is an excellent thing for every honest druggist who is independent enough to take advantage of it. It is, of course, impossible in those large cutting centres, such as Brooklyn, New York or Philadelphia, where from forty to fifty per cent. of the drug stores are owned by the wholesale druggists, and the proprietors are not independent men, but owned by the wholesale druggists, and have to take what is given them. In other places, there is no reason why the pharmacist should not resort to every means to protect his trade. So far as the simple statement that we cannot succeed in maintaining rates is concerned, I say once more that we can succeed, if we only dare to carry out the American Pharmaceutical Association plan.

MR. BRESLIN: I regard this whole subject with very little favor from a professional standpoint, and it ill becomes us to discuss such an insignificant matter. We are lowering our dignity, and the more we wrangle about the cut-rate evil, the more we advertise the patent medicines which we all want to have abolished. To my mind, the more you debate the matter the deeper you get into the mire. We have met with a great deal of trouble in New Orleans, where we have a celebrated cutter, who advertises his business far and wide. He has vast wealth at his disposal, and his bank account would probably exceed the combined capital of at least fifteen or twenty men who are tolerably wealthy. But my point is this: We must, as professional men, ignore this patent medicine question, and must stand upon our dignity. I am sorry indeed, that such an unworthy question has crept into an Association so distinguished as the American Pharmaceutical Association. It is true that pharmacists seek commercial relief, but there are certain trade matters which are too insignificant to be discussed in an Association of this kind. This patent medicine business is one of them, and professional dignity requires that we should ignore it *in toto*. I wish to add that the remark was made by a speaker this evening, that a pharmacist could not prescribe; but we know too well that the patent medicine manufacturers prescribe, through advertisements in the newspapers from

day to day. Have they the right to prescribe? Are they not violating the State laws in thus publicly prescribing? This is an interesting phase of the question which might be discussed, if it were worthy of discussion; but as I have already said, it is a matter that it is to our interest to ignore. As one gentleman very aptly remarked, eighty per cent. of the druggists of this country are not affected by the patent medicine question, and take no interest in it for that reason. If the pharmacists were dependent on the sale of proprietary articles in order to exist, it would be better for them to shut up shop; but such is not the case, and nobody can prove that it is. I know that from my sales of patent medicines I can expect very little return. It is the prescription department that I look to for my support, and it is to conduct the business of dispensing medicines that pharmacists are trained. That is what we are expected to do, to fill prescriptions, and not confine our attention to the sale of patent nostrums.

(Mr. Sheppard here took the chair *pro tem.*)

MR. TORBERT: I always like to hear our profession exalted, because we know it is an honorable one; but I think, in this world of practical affairs, that we do not want to be always dreaming in the shadows. We have got to recognize hard, plain facts, when we run up squarely against them. We must recognize that the patent medicine business, unprofessional as it is, and much as we deplore that it constitutes so large a part of our business, is a fact; and therefore to take the position that a pharmacist in order to honor his profession must ignore it, does not seem to me to be very wise. I would like to ask the gentleman who has just spoken (Mr. Breslin) how much of pure pharmacy and exalted scientific information a pharmacist must possess in order to put up a prescription of bromidia or a hundred and one of those other patent nostrums (as much and as completely patent medicines as Ayer's Sarsaparilla or Bull's Cough Syrup) which are standing on the shelves of every prescription counter in this country?

MR. BRESLIN: I would answer by saying that that is another feature of our business.

MR. TORBERT: It seems to me that this Section was designed solely for the purpose of considering the various ills which afflict the commercial interests of pharmacy. Now, we all know that this patent medicine question is a very great evil, which injures pharmacy; but it is here, and it is here to stay. We do not remedy matters by assuming that the pharmacist must wrap the drapery of professional dignity around his manly form and ignore the evil, which undoubtedly exists, on account of the high scientific features of our profession. Let us, therefore, use our best judgment and meet the situation as it actually is.

Now, with reference to the resolution presented by Mr. Alpers. I think that it probably accords with the judgment of many of those present, but let us consider the wisdom of such a resolution in view of the existing situation. This Association, for a number of years past, has considered the proprietary medicine question through the medium of this Section. It has sent delegates to the National Wholesale Druggists' Association and the Proprietors' Association, and at different times has made different arrangements for correcting the evils which have grown up out of cutting in proprietary articles. Now, then, we have turned the whole matter over to the Interstate League, and this being so, why do we need at this time to adopt Mr. Alpers' resolution? Its necessary result will be to throw up an obstruction between the retail druggists and the proprietors in settling the cut-rate problem, which we all want to see put right. Furthermore, I do not think that members of the American Pharmaceutical Association need to adopt a resolution which sets forth that we should deprecate the use of unscientific preparations. I think that the pharmacists of this country will do so without the necessity for this Association having to pass resolutions to that effect.

(Mr. Torbert resumed the chair.)

Mr. Mittelbach: We in the interior small towns have no department stores to contend with, and there are very few towns that I know of in which cutting exists. We have other evils to contend with, and one of them is the prescribing of proprietary articles by physicians. When the National Formulary came out I hailed it with delight, thinking that it pointed to a way out of the difficulty. It is certainly a great disadvantage to those who are far away from the wholesale market to be compelled to invest large sums of money in these proprietary preparations. To remedy this evil I conceived the idea of introducing the preparations of the National Formulary by connecting myself with the local Physicians' Society. I was endorsed in this procedure by a great many of my fellow pharmacists, all of whom thought that the idea was a good one. I went forward with it, and explained my views to the physicians through my medical friends at home who were members of the Society. They endorsed everything I said, and commended my scheme. They thought it would be a very good idea if the physicians and druggists could meet together and discuss such evils as affected both professions. I prepared a paper to be read before the Society, but according to the rules it had to lie over for three months, as their meetings take place every three months. I was led to believe that my proposition would be favored by the Society, which would amend its rules so as to enable a pharmacist to become an associate member. Of course the Society could not make us active members, because that would interfere with the State law; but as associate members they could take us in, and we could then discuss questions affecting both professions. It was my intention to introduce the preparations of the National Formulary, to replace the proprietary articles as much as possible, knowing that they were all right, for I had previously prepared these preparations, and induced the local physicians to prescribe them. Thus far all went well, but at the next meeting of the Society the physicians had had three months to think the matter over, and this patent medicine question came up for discussion. One doctor in particular took an active part in the debate. He said: "The druggists are all prescribers. I have here clippings from newspapers in which advertisements appear, naming druggists in this vicinity who are recommending patent medicines or selling patent medicines. The manufacturers of these nostrums are advertising the druggists by printing their names on the labels, stating that the medicines are sold by them." They do that in all the smaller towns, and they also use other advertising schemes, such as almanacs. I don't see how a pharmacist in a small town can control these matters and entirely ignore the patent medicine manufacturer. Now, the question is this: if we proceed, as advised in Mr. Alpers' resolution, to throw out patent medicines and replace them with our own, will it not be a very serious mistake, and result in further separating the physicians from us? When we have taken these patent medicines from our shelves, and substituted them with our own, the physicians will have a good excuse for bringing charges against us on account of being prescribers. Now, the idea that our friend from New Orleans has presented has always impressed me favorably. I believe in letting the matter alone, just ignoring the patent medicine business entirely. Sell them whenever they are demanded, but ignore them as much as possible. But if we place our own preparations on our shelves, I am afraid that we shall lose a great deal of patronage in the end from physicians, and thus injure ourselves in a business way.

On motion of Mr. Sheppard, speeches were limited to three minutes, and it was ordered that no member should speak twice on the same subject.

Mr. Rogers: I am opposed to such a resolution as the one presented by Mr. Alpers,

because I am a law-abiding citizen. In Kentucky the pharmacy law has a special section prohibiting substitution. If a man enters a drug store and asks for a bottle of Hood's Sarsaparilla, he has got to have it; and if I tell him that I have a sarsaparilla of my own which I think is better, there must be a printed formula on the bottle, giving the doses, etc., also stating what it is good for, just as the Hood label is arranged. If I recommend my own preparation and a physician discovers it, I am likely to lose his patronage, at the same time rendering myself liable to a fine of $25 for the first offence of counter, prescribing and $50 for the second and each succeeding misdemeanor of this kind. That is why I am opposed to the resolution.

MR. HODGES: I desire to enter my protest against the resolution. It seems to me that it is not at all the proper way to overcome the difficulty. Patent medicines are commodities in the retail drug business to the same extent as porous plasters or anything else. This Association, in my opinion, and all other State organizations, should endeavor to confine the sale of patent medicines, and anything else intended for the relief of suffering, to a legitimate pharmaceutical channel. That is where the work should be done, and it seems to me that we have been paying too much attention to scientific matters, a d not enough to the commercial features of our business. A gentleman remarked here, this evening, that only eighty per cent. of the druggists feel the effects of the patent medicine evil. Now, I think otherwise, and affirm, on the contrary, that over eighty per cent. of the druggists of this country are not able to attend our meetings because of the poor remuneration they are receiving from their business. We all know that three-fourths of the druggists in our large cities, except those who are favorably situated on the prominent thoroughfares, are not able to get relief by employing and paying sufficient salaries to registered pharmacists to assist them in their work. We know that condition of affairs exists, and must admit that the remuneration in the drug business, at present, is such that the man who attempts to conduct a pharmacy on legitimate principles will get badly left and go to the wall. As for the professional idea, I am not totally out of accord with it; I agree with it, and hope it will remain a prominent feature in our calling; but it certainly seems to me that the important part of our business is the one which supports us.

MR. STEDEM: I favor Mr. Alpers' plan for maintaining rates. I have charge of a store that at one time had a large patronage, but eventually went down. I took hold of it, although I was told by many that I would be unable to last three years, while some of my neighbors were not certain that I would continue so long as that. The first thing I did was to throw out cigars; second, put patent medicines entirely out of sight; third, put up preparations of my own, printing the formulas on the labels. Well, the business went up from $300 a month until the last account I took was nearly $1,700, and we have done as high as $2,000. The prescriptions increased from $2,500 a year until, last season, we put up nearly $14,000 in one year. And it was all done without consulting any physician, or anybody else. We rely on the public for our support, and when we have any favors to dispense, we give them to the people who bring the prescriptions to us. We give the physicians to understand that we have no favors to ask from them, treat them very courteously, but do not send them elaborate Christmas presents or anything of the kind. If the drug business were only carried on in a proper way, it would be money in many a man's pocket. That is my opinion of the matter.

On motion of Mr. Jamieson, Mr. Alpers' resolution was laid on the table.

MR. WHITNEY: The hint thrown out by the gentleman from New York is a good one. In 1844, when I first engaged in business, all proprietary goods were sent directly from the manufacturer to the pharmacist, and we had no difficulties whatever. All the diffi-

culties which have since arisen have been caused by the distributor. The evil has commenced and will continue until a check is put on the distributor, for until that is done you will never overcome the trouble. The manufacturers of proprietary goods have got the retail druggists to distribute their goods and make them rich. We have been their servants until they have trodden us under foot. My rule to prevent an increase of the evil is this: no new proprietary goods enter my store at my expense—not a dollar's worth. If the public demand from me certain things and I can make a fair commission on them, such as I am entitled to from my knowledge and experience in pharmacy, in protecting them from that which is wrong, all right. But if a man comes to me with a "snide" article for sale, and asks me to buy from fifty to a hundred dollars' worth to aid him in his nefarious scheme, am I going to take it? Not by any means. Now, the manufacturers have asked this Association and others to present to them some feasible plan. We have formulated one, but they have found a flaw in it and say that it is impracticable. The Interstate League has come forward and proposed another. From the information presented this evening, I understand that their plan has not been a success. Therefore, I hope and trust that the delegates appointed to attend the Detroit meeting will be instructed not only to urge upon the members of the Interstate League the necessity for enforcing the American Pharmaceutical Association plan, but to tell the manufacturers that if they want the co-operation of the druggists they must protect them, and if they do not, they may eventually have cause to regret it.

(Mr. Sheppard took the Chair temporarily.)

Mr. Torbert: I have a resolution which I want to present. It contemplates two things: first, the approval of the acts of our representatives, by which we are bound; second, it will do a very great deal towards accomplishing what so many members of the Association desire, by relegating these prolonged discussions that we have had every year, in this Section, on the cut-rate question, to the Interstate League, so that if any one wants to hear further discussions upon it he will have to attend the meetings of the League. My resolution is as follows:

Resolved, That this Association hereby approves of the action of our representatives at Montreal, in leaving the execution of the American Pharmaceutical Association plan entirely in the hands of the Interstate League.

I move the adoption of this resolution.

Mr. Jamieson: Does that resolution contemplate the abandonment of the American Pharmaceutical Association plan by this Association, providing the Interstate League does not carry it out?

Mr. Torbert: No; the Interstate League took up the American Pharmaceutical Association plan, and assumed the responsibility placed upon it by the Proprietors' Association of carrying it into execution. It is our plan, but the League is charged with its execution.

Mr. Stevens: There is one thing I never was in my life—I was never a coward. The trouble with most pharmacists is that they are cowards. They are afraid to stand up and show that they have backbone. Some man comes along and announces that he is going to cut our throats, and we sneak back into a hole instead of taking out our knives and cutting his throat. Why should we stand by and be cut? We will not, if there is any manliness left in us, or any backbone remaining in the trade. We all know that we have suffered severely on account of this cowardice, and there is cowardice evinced right on this very floor to-night. Cowardice has injured all our resources and frustrated our efforts everywhere; but we are not all that way. What I want to see done is what I tried

to accomplish several years ago, when we endeavored to get the men who were foremost and fearless together for the purpose of fighting the battle for our rights. Then we made some of our opponents so sick that they were ready to give up the fight, and had it not been for the cowardice displayed by some of our people in Brooklyn we should have defeated them at the start; but our leaders defeated us by leaving us in the lurch. Now, there is a plan we want to see carried out, and that is the American Pharmaceutical Association plan. It has been well arranged, and we must stick by it, and not try to get away from it. The plan has been offered by this Association and accepted by other organizations. Others have tried to get away from it, knowing the cowardice that exists in our ranks. They intended to take advantage of that and never fulfill their promises. Now, I understand from what has been said that our plan was committed to the charge of the Interstate League to execute, but the League has not done its work. Perhaps, if necessary, another organization may be employed to carry it out. In any event, something must be done if we are to hold our place in this world. This is not the day nor the time to sit down and howl because of what somebody else is doing. We must fight, and no man can live unless he is aggressive. If a man gives up and lets his enemies trample him under foot, he deserves his fate.

Mr. Torbert's motion to adopt his resolution was then put to a vote, having been duly seconded, and was carried.

The report of the Committee appointed at the White Mountains meeting to attend the Montreal meeting of the National Wholesale Druggists' Association, was called for three times during the session, but none of the committee were present and no report was sent.

A paper entitled, "Danger of Our Prescription Business," by Mr. Tropmann, referred by the Section on Pharmaceutical Education and Legislation, was read by title, and, on motion, was referred to the Committee on Publication for action.

Nomination and election of officers for the ensuing year being in order, Mr. Stedem nominated Mr. Rogers, of Louisville, for Chairman, and Mr. Torbert nominated Mr. J. O. Burge, of Tennessee, for Secretary.

A vote was taken and the nominees were elected.

Messrs. Hamilton and Seabury were appointed a committee by the Chair to conduct the newly-elected officers to the platform. The installation having taken place, speeches were called for.

MR. ROGERS: I thank you sincerely, gentlemen, for the honor you have conferred upon me in electing me to the important office of Chairman of this Section. I have broad shoulders, and can assure you that I shall endeavor to faithfully perform the duties of the position. There is good work for this Section to accomplish; we need to stand firmly together to carry out the objects for which this Section was formed, and you can depend on me to do all that lies in my power to aid in making our labors effective in producing practical results. Again I thank you.

MR. BURGE: In acknowledging the honor you have shown me by selecting me to act as your Secretary during the coming year. I not only thank you for this mark of your esteem, but appreciate the confidence you repose in me, which has led to placing me in this position of trust. To the best of my ability I shall endeavor to do the work connected with the office. I hope that my efforts may be successful and meet with your approval.

The Section then adjourned.

APPENDIX.

ENTERTAINMENTS AT THE FORTY-FIRST ANNUAL MEETING.

Of course the greatest entertainment for the members was afforded through their visits to the World's Columbian Exposition. The social gathering place, however, for the members of the American Pharmaceutical Association at the Forty-first Annual Convention was the Casino in Jackson Park, and it was at that handsome building, on the evening of Monday, August 21st, that a reception was given, and at which there was a large representation not only of the visiting members, but also of the pharmaceutical friends and members of the Association resident in Chicago.

There were many pleasant reunions among the large number assembled, many of whom had not grasped each other by the hand since the meeting of last year, so that the evening passed very pleasantly in conversation, or in listening to the music, while they sat in groups at the small tables and were regaled with the refreshments so bountifully provided by the local committee having the matter in charge.

On Wednesday. August 23d, the pharmacists took a holiday from the business of the Association, and spent it at the World's Fair; many of them meeting at the Illinois Building, and from there dividing into smaller parties to wander among the treasures of that wonderful exhibition. In the evening all assembled again at the Casino, where a banquet was given, and about six hundred guests seated themselves at the handsomely decorated tables, and in the intervals between the music from the Schmoll Orchestra, and the disposing of the viands of an elaborate menu, they listened to the many toasts; the spontaneous eloquence of the evening seemed contagious, and rivaled in brilliant out-burst the electrical and pyrotechnic display, which was occupying the attention of thousands of people gathered on the lake front—the sound of which so often seemed to break in and mingle with the applause at some uncommonly mirthful sally from a guest.

Our English brethren from the other side added considerably to the enjoyment of the occasion by the happy and felicitous responses so frequently made, and the occasion was a long to be remembered one.

Again on Saturday the untiring Local Committee had invited the Association to another entertainment, which, at this time, took the form of a

trip to Lincoln Park. It had been proposed to make the excursion to the club-house by way of the lake steamer, the whale-back; but Lake Michigan that morning presented so rough an aspect, that it was deemed more comfortable for the guests to drive. Tally-hos, coaches and carriages were pressed into service, and as fast as they could be filled from the steps of the Art Institute, they drove off with the merry crowd along the lake front to the club house at Lincoln Park, where a lunch was provided in the open café. Conspicuous among the guests seated at the tables, were the three Parsees who had been attending the sessions of the Association, and whose swarthy faces, coal-black hair, and very odd-looking hats, which they never removed, formed prominent objects.

Again the party entered the vehicles and drove to Van Buren street, where they alighted and went on board the whale-back "Columbia" to steam down the lake to the pier at Jackson Park.

Although tickets of admission to the Fair had been presented to each guest while at the club house, many preferred paying their entrance fee and retaining the very pretty ticket as a souvenir, not only of the World's Fair, but also of the liberality of the Chicago Committee. Again all entered the Casino and partook of a luncheon, and listened to speeches from the incoming President and from members of the Local Committee, and from the visitors who were full of praise for the varied and hospitable entertainments so lavishly provided by the Chicago pharmacists. With this social function the forty-first annnal meeting closed, and the members were soon wending their way to their homes in all parts of the country, realizing that they had attended the most remarkable and memorable American Pharmaceutical Association meeting that has ever been held.

LIST OF LIFE MEMBERS.

PUBLISHED IN ACCORDANCE WITH RESOLUTIONS OF THE COUNCIL.
SEE PROCEEDINGS 1888, PAGE 41.

[Names of Life Members under the Old Constitution in *Italics*; under the present By-Laws, in SMALL CAPITALS.]

Abernethy, Maxwell.
Ash, Matthew F.
Baxley, J. Brown.
BAYLEY, AUGUSTUS R.
Berrian, George W.
BIROTH, HENRY.
Blatchford, Eben.
BORING, EDWIN M.
Bower, Henry.
Bullock, Charles.
Burnett, Joseph.
CANNING, HENRY.
Colcord, Samuel M.
Cummings, Henry T.
CUTLER, EDWARD WALDO.
Dearborn, George L.
Doliber, Thomas.
DRURY, LINUS D.
Du Puy, Eugene.
EBERT, ALBERT E.
Ellis, Evan T.
FOUGERA, EDMUND C. H.
FULLER, OLIVER F.
Gale, Edwin O.
Gale, William H.
Gallagher, Charles K.
Goodwin, Wm. W.
Gordon, Wm. J. M.
Grahame, Israel J.
GRIFFITHS, ALBERT R.
Haviland, Henry.
Hay, Henry H.
HEINITSH, CHARLES A.
Heintzelman, Joseph A.
Heyl, James B.
HOLZHAUER, CHARLES.
Hudnut, Alexander.
JACQUES, GEORGE W.
Jenks, Wm. J.
JONES, EDWARD C.
Kent, Robert R.
KESSLER, EDWARD F.
Kidder, Samuel.
KING, JAMES T.
KLUSSMANN, HERMANN.
LAND, ROBERT H.
LEE, JAMES A.
Leitch, Arthur.
LEMBERGER, JOSEPH L.
McConville, Thomas A.
McPherson, George.
Mellor, Alfred.
Metcalf, Theodore.
MILBURN, JOHN A.
MILHAU, EDWARD L.
Moffit, Thomas S.
Moith, Augustus T.
Molwitz, Ernest.
Newman, George A.
Ollif, James H.
ORNE, JOEL S.
Paine, James D.
Parr, John C.
Patten, I. Bartlett.
Peabody, William H.
Perkins, Elisha H.
Perot, T. Morris.
PFINGST, FERDINAND J.
Rano, Charles O.
REMINGTON, JOSEPH P.
Rittenhouse, Henry N.
ROBINSON, JAMES S.
Rollins, John F.
ROSENGARTEN, MITCHELL G.
Russell, Eugene J.
SANDER, ENNO.
SEABURY, GEORGE J.
Sharp, Alpheus P.
SHEPPARD, SAMUEL A. D.
Snyder, Ambrose C.

Sweeney, Robert O.
Taylor, Alfred B.
Thompson, William B.
TUFTS, CHARLES A.
Turner, T. Larkin.
Vernon, James.
Wardell, Robert C.
Warner, William R.
WHITE, AARON S.

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WHITFIELD, THOMAS.
WHITNEY, HENRY M.
Wiegand, Thos. S.
WINKELMANN, JOHN H.
WINTER, JONAS.
WOLTERSDORF, LOUIS.
YORSTON, MATTHEW M.
ZEILIN, J. HENRY.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED FOR ANNUAL DUES OR CERTIFICATES FROM JULY 1, 1892, TO JULY 1, 1893.

	Annual Dues.	Certificates.
Abbott, Louis L. '92	$5 00	
Adamick, Gustave H. '92–'93	10 00	
Adams, John D. '92–'93	10 00	
Ahlbrandt, Henry E. '92	5 00	
Aird, William '93	5 00	
Albrecht, Joseph '92	5 00	
Alexander, Maurice W. '92	5 00	
Alfreds, Henry J. '90 & '92	10 00	
Alpers, William C. '93	5 00	
Amend, Bernard G. '92	5 00	
Amend, Otto P. '92	5 00	
Anderson, Charles B. '92	5 00	
Anderson, Finis L. '92	5 00	
Anderson, Samuel L. '93	5 00	
Andriessen, Hugo '93	5 00	
Angell, Richard '92	5 00	
Apel, Frederick E. '92	5 00	
Armor, Alpheus '92	5 00	
Armstrong, Geo. R. '92	5 00	
Arny, Harry V. '93	5 00	
Arrington, Homer H. '92	5 00	
Aspinall, Walter A. '92	5 00	
Asplin, John H. '92	5 00	
Aubley, Samuel '92	5 00	
Aufinwasser, Hugo W. '92	5 00	
Avary, Moody B. '92	5 00	
Averill, Wm. H. '93	5 00	
Baier, Charles G. '92	5 00	
Bailey, Frederick '93	5 00	
Bain, Andrew W. '90	5 00	
Baker, Edwin '93	5 00	
Baker, Frederic W. K. '92	5 00	
Baker, T. Roberts '93	5 00	
Balitzley, Zachariah T. '92	5 00	
Baridon, Louis R. '93	5 00	
Barll, Jos. B. '92	5 00	
Bartells, Geo. C. '92	5 00	
Bartlett, N Gray '92	5 00	
Bassett, Arthur '93	5 00	
Bassett, Joseph '92	5 00	
Bauer, Louis G. '92	5 00	
Baur, Jacob '92	5 00	
Baylis, Lewis F. '93	5 00	
Beach, Clifton H. '92	5 00	
Beal, James H. '92–'93	10 00	
Beardsley, Jos. L. '92	5 00	
Becker, Charles L. '92	5 00	
Beckmann, Oscar A. '92	5 00	
Behrens, Paul J. '92	5 00	
Bell, John I. '92	5 00	
Bell, S. Howard '93	5 00	
Belt, James F. '92–'93	10 00	
Belt, Z. James '92–'93	10 00	
Bendiner, Samuel J. '93	5 00	
Benton, Wilber M. '93	5 00	
Bernhard, Chas. H. '92	5 00	
Berryhill, Henry P. '93	5 00	
Best, John '92	5 00	
Betz, Otto E. '92	5 00	
Beyschlag, Charles '93	5 00	
Amount carried forward	$330 00	

	Annual Dues.	Certificates.
Amount brought forward	$330 00	
Biddle, Herbert G. '93	5 00	
Billing, Henry M. '92	5 00	
Binkley, George K. '92–'93	10 00	
Bird, Harry L. '92	5 00	
Bishop, Francis M. '92	5 00	
Bishop, Samuel E. '92	5 00	
Black, John R. '93	5 00	
Blaikie, William '92–'93	10 00	
Blair, Henry C. '92–'93	10 00	
Blakely, Geo. C. '92	5 00	
Blank, Alois '92	5 00	
Blestren, Hans M. G. '92	5 00	
Bley, Alphonso A. W. '93	5 00	
Blocki, Wm. F. '93	5 00	
Bocking, Edmund '92	5 00	
Bodemann, Wilhelm '92	5 00	
Boehm, Solomon '92	5 00	
Boerner, Emil L. '92	5 00	
Bogel, Wm. G. H. '92	5 00	
Boggs, Edwin L. '92	5 00	
Boisvert, Pierre '92	5 00	
Bond, John B. '92	5 00	
Bondurant, Chas. S. '92	5 00	
Borell, Henry A. '92–'93	10 00	
Bossidy, Bartholomew '92	5 00	
Bostick, Elmer E. '92	5 00	
Bower, Henry A. '93	5 00	
Bowker, Everett F. '92	5 00	$5 00
Bowron, Walter H. '92	5 00	
Boyd, Geo. W. '93	5 00	
Boyd, Wm. P. '92	5 00	
Boyden, Edw C. '93	5 00	
Boynton, Herschell '92	5 00	
Brack, Charles E. '92	5 00	
Brandon, Cole W. '92	5 00	
Brandt, Edmund W. '89–'90	10 00	
Braunwarth, Alice L. '92–'93	10 00	
Breningstall, Reuben G. '92	5 00	
Breslin, Michael T. '92	5 00	
Bridges, Charles H. '92	5 00	
Broadus, T. Madison '92	5 00	
Brooks, Frederic P. '93	5 00	
Brooks, Geo. W. '92–'93	10 00	
Brother, William '92–'93	10 00	
Brown, Albert E. '92	5 00	
Brown, Henry J. '92	5 00	
Brown, Robert J. '92	5 00	
Bruce, James '92	5 00	
Bruck, Philip H. '93	5 00	
Brundage, Albert H. '92	5 00	5 00
Brundage, Fred. '92	5 00	
Brunner, Norman I. '92	5 00	
Brunswig, Lucien N. '92–'93	10 00	
Buck, John '92	5 00	
Buck, John L. '92	5 00	
Buckner, John A. '92	5 00	
Burg, John D. '92–'93	10 00	
Burge, James O. '92	5 00	
Burghardt, George H. '92	5 00	
Amount carried forward	$670 00	$10 00

	Annual Dues.	Certificates.
Amount brought forward.....	$675 00	$10 00
Burgheim, Jacob .....'92–'93	10 00	
Burnham, Alfred A. Jr .....'93	5 00	
Burns, J. Kellar..... ...'92	5 00	
Burrough, Horace .....'93	5 00	
Butler, Charles H. .....'93	5 00	
Butler, Freeman H.....'93	5 00	
Butler, P. H. .....'92	5 00	
Button, Charles E. .....'93	5 00	
Calder, Albert L. .....'92	5 00	
Caldwell, James W. .....'92	5 00	
Candidus, Philip C..... ....'92	5 00	
Capper, Wm. E. .....'92	5 00	
Carrell, Eugene A.....'92	5 00	
Carrol, Edward. .....'92	5 00	
Carslake, Geo. M. .....'93	5 00	
Carter, Frank H. .....'93	5 00	
Carver, Frank H.....'93	5 00	
Case, Charles H. .....'92	5 00	
Case, Geo. D. ....'92	5 00	
Caspari, Charles, Jr. ....'93	5 00	
Casper, Thos. J.....'93	5 00	
Catlin, Ephron..... .....'92	5 00	
Chalin, Louis F. .....'92	5 00	
Chapo, Francisco A. .....'92	5 00	5 00
Chapin, Fred. H. .....'92	5 00	
Chapin, Henry A. .....'92	5 00	
Chapin, Wm. A.....'93	5 00	
Charroppin, Emile L. .....'93	5 00	
Chase, Walter H. .....'92	5 00	
Cheatham, Thomas A.....'92	5 00	
Christiani, Charles .....'93	5 00	
Church, Merton E. .....'92–'93	10 00	
Clapp, Geo. H. .....'92	5 00	
Clark, John A.....'92	5 00	
Clark, Louis G.....'92	5 00	
Cluverius, Wat. T. .....'92–'93	10 00	
Cobb, Geo. W.....'92	5 00	
Cobb, Ralph L. .....'92–'93	10 00	
Cohn, Richard. .....'92	5 00	
Cole, Charles M. .....'92–'93	10 00	
Cole. Howson W.....'93	5 00	
Cole, Victor L.....'93	5 00	
Colen, James A. .....'92	5 00	5 00
Colgan, John .....'92	5 00	
Collins, Albert B.....'93	5 00	
Colton, James B. .....'92	5 00	
Cone, Alfred G.....'92	5 00	
Cone, John W.....'93	5 00	
Conger, Iliff.....'92	5 00	
Conrad, John.....'92	5 00	
Conrath, Adam .....'93	5 00	
Constantine, Edw. R. .....'92	5 00	
Cook, Frank L.....'92	5 00	
Cook, Gilbert S.....'92–'93	10 00	
Coon, James V. D.....'92	5 00	
Copeland, Sidney F.....'92–'93	10 00	
Cornell, Edw. A..... '92	5 00	
Cotton, Wm. H. .....'93	5 00	
Cox, John T. ..... '92	5 00	
Cready, Edward E. .....'92	5 00	
Craig, John W.....'92	5 00	
Cramer, Max .....'92	5 00	
Crawford, Walter B., Jr. .....'93	5 00	
Criswell, Francis M.....'92–'93	10 00	
Crolius, Frank M. ....'92	5 00	
Crona, Sixtus E. S. .....'92	5 00	
Cronheim, Solomon..... '92–'93	10 00	
Croom, James D. .....'92	5 00	
Crum, John D. .....'92	5 00	7 50
Culbreth, David M. R .....'92	5 00	
Culver, Anson A.....'93	5 00	
Cummings, Theodore F.....'92	5 00	
Cummings, J. Wirt .....'92	5 00	
Currier, Edward H .....'92	5 00	5 00
Curtman, Charles O.....'92	5 00	
Amount carried forward.....	$1095 00	$32 50

	Annual Dues.	Certificates.
Amount brought forward.....	$1095 00	$32 50
Cushman, Henry C.....'92	5 00	
Cutts, Foxwell C., Jr.....'93	5 00	
Dadd, John A. .....'93	5 00	
Danforth, Edmund C.....'92	5 00	
Dare, Chas. F.....'92–'93	10 00	
Daubach, Charles J.....'92	5 00	
D'Avignon, J. Eugene.....'93	5 00	
Davis, Edward H.....'92–'93	10 00	
Davis, Eugene M.....'92	5 00	
Davis, George R.....'92	5 00	
Davis, Theo. G.....'93	5 00	
Davis, Wm. M.....'92	5 00	
Dawson, Edward S., Jr.....'92	5 00	
De Forest, Wm. P.....'92	5 00	
De Graff, David..... '92	5 00	
De Lang, Alfred. .....'92	5 00	
Dedrick, Wm. F.....'92	5 00	
Deibert, Thomas I.....'92	5 00	
Dejan, J. B. G.....'93	5 00	
Dell, Wm. A.....'92	5 00	
Delouest, Edward.....'93	5 00	
Demond, Otto J.....'92–'93	10 00	
Dennin, Edwin C.....'92	5 00	5 00
Desmond, Edward.....'92	5 00	
Deutsch, Julius W.....'92	5 00	
Dewoody, Wm. L.....'93	5 00	
Dick, Dundas.....'92	5 00	
Diehl, C. Lewis.....'92	5 00	
Dietrich, H. Dickson.....'92	5 00	
Dill, J. Byron.....'93	5 00	
Dilly, Oscar C.....'92	5 00	
Dimock, Robert H. .....'93	5 00	
Dittmer, Charles L.....'92	5 00	
Dixson, Frederick H. .....'92	5 00	5 00
Dobbins, Edward T. .....'93	5 00	
Dodd, Simon W. .....'92	5 00	
Dohme, Alfred R. L.....'93	5 00	
Dohme, Charles E.....'93	5 00	
Dohme, Louis.....'93	5 00	
Dolan, Frank L. .....'93	5 00	
Donaldson, Pierre A.....'93	5 00	
Dorner, Emil A.....'92–'93	10 00	5 00
Dougherty, Samuel E.....'92	5 00	
Douglass, Henry, Jr.....'92–'93	10 00	
Downing, Benj. F., Jr.....'92	5 00	
Downing, Lucien B.....'92–'93	10 00	
Drake, Chas. W.....'93	5 00	
Drake. John R.....'93	5 00	
Dreher, Louis.....'92	5 00	
Dresser, George E.....'92	5 00	
Driggs, Chas. M. .....'92	5 00	
Druehl, Frank A.....'92–'93	10 00	
Drury, John S. .....'92	5 00	
Duble, Jesse B.....'92	5 00	
Duckert, Louis A. .....'92	5 00	
Duckett, Walter G. .....'93	5 00	
Dufault, Hilaire .....'92	5 00	
Dunham, Henry B.....'92–'93	10 00	
Dunn, John A.....'93	5 00	
Dunning, Lyman T. .....'92	5 00	
Dunwody, Richard G.....'92–'93	10 00	
Dupont, William.....'92	5 00	
Durban, Sebastian C. .....'90	5 00	
Durkee, William C.....'93	5 00	
Dutcher, Alfred L. .....'92–'93	10 00	
Dyche, David R. .....'92	5 00	
Eaton. John M.....'92	5 00	
Eberbach, Ottmar..... '93	5 00	
Eberle, Charles L.....'92	5 00	
Eccles, Mary H.....'92–'93	10 00	
Eccles, Robert G.....'93	5 00	
Eckel. Augustus W.....'93	5 00	
Eckford, Jos W.....'92	5 00	
Eddy. Henry C.....'92	5 00	
Edwards, Nathan W .....'92	5 00	
Amount carried forward.....	$1525 00	$47 50

	Annual Dues.	Certificates.
Amount brought forward.....	$1525 00	$47 50
Edwards, Wm. F.....'92	5 00	
Eger, George.....'92	5 00	
Eggers, Frederick H.....'92	5 00	
Ehrlicher, Henry M.....'92	5 00	
Eichrodt, Charles W.....'92–'93	10 00	
Eimer, Charles.....'92	5 00	
Ekman, N. Adolf.....'92	5 00	
Eliel, Leo.....'92	5 00	
Elliott, Arthur H.....'92	5 00	
Elliott, Henry A.....'93	5 00	
Emanuel, Louis.....'92–'93	10 00	
Emerson, Hermann L.....'92–'93	10 00	
Emich, Columbus V.....'93	5 00	
Enterkine, James E.....'92	5 00	7 50
Ernst, Frank F.....'92	5 00	
Eschman, Clemens L.....'92	5 00	
Eschmann, F. W. R.....'91–'92	10 00	
Estabrook, Henry A.....'93	5 00	
Evans, Jos. S.....'93	5 00	
Ewing, Frederic C.....'92–'93	10 00	
Eyssell, George.....'92	5 00	
Fahey, Edward F.....'92	5 00	
Fairchild, Benj. T.....'93	5 00	
Fairchild, Samuel W.....'93	5 00	
Farlow, John B.....'92	5 00	
Farrar, Samuel R.....'92	5 00	
Farrell, Thos. H.....'92	5 00	
Fay, Hamilton.....'92	5 00	
Fechter, Arthur E.....'92	5 00	
Feemster, Joseph H.....'92	5 00	
Fenner, Alexander W.....'92	5 00	
Fetterman, Thos. M.....'92	5 00	
Field, Amos.....'91–'92–'93	15 00	
Field, Claud.....'93	5 00	
Finlay, Alexander K.....'92	5 00	
Finn, Thomas.....'92–'93	10 00	7 50
Fischer, Henry J.....'92	5 00	
Fischer, Oscar F.....'92	5 00	
Fischer, Phil.....'92	5 00	
Fish, Chas. F.....'91–'92	10 00	
Fish, Frederic W.....'92	5 00	
Fisher, Elbert E.....'92	5 00	5 00
Flanagan, Lewis C.....'93	5 00	
Fleischer, Adolph T.....'92–'93	10 00	
Fleischmann, Augustus T.....'92	5 00	
Flint, Geo. B.....'03	5 00	
Flood, Wm. H.....'92	5 00	
Ford, Chas. M.....'93	5 00	
Ford, Herbert L.....'92	5 00	
Ford, W. Thomas.....'92	5 00	
Forsyth, Wm. K.....'92	5 00	
Fortier, Lawrence H.....'92	5 00	
Foster, Wm. O.....'92	5 00	
Fowler, Jos. W.....'92	5 00	
Fox, Peter P.....'92	5 00	
Fraisse, Louis A.....'92	5 00	
Franken, James L.....'92–'93	10 00	
Franklin, Philip H.....'92	5 00	
Fraser, Robert P.....'92	5 00	
Frauer, Herman E.....'93	5 00	
French, Harry B.....'93	5 00	
Frere, Alexander G.....'92	5 00	
Frohwein, Richard.....'92	5 00	
Frost, Louis E.....'92	5 00	
Frost, William A.....'92	5 00	
Fr h, Carl D. S.....'92	5 00	
Frye, Geo C.....'93	5 00	
Gallagher, John A.....'92	5 00	
Galt, Edward P.....'92	5 00	
Gammon, Irving P.....'92	5 00	
Gano, Wm. H.....'92	5 00	
Gardner, Robert W.....'92	5 00	
Gates, Howard E.....'93	5 00	
Gaus, Charles H.....'92–'93	10 00	
Gaus, Louis H.....'92–'93	10 00	
Amount carried forward.....	$1965 00	$67 50

	Annual Dues.	Certificates.
Amount brought forward.....	$1965 00	$67 50
Gayle, John W.....'93	5 00	
Gaylord, Henry C.....'92	5 00	
Gegelein, Frederick L.....'93	5 00	
Geier, Oscar W.....'92	5 00	
Geisler, Jos. F.....'92	5 00	
George, Chas. T.....'92–'93	10 00	
Gerhard, Samuel.....'92	5 00	
Gessner, Emil A.....'93	5 00	
Gibson, Charles.....'92–'93	10 00	
Gibson, James E.....'92	5 00	
Gibson John S.....'92	5 00	
Gilbert, Charles A.–.....'92	5 00	
Gill, George.....'93	5 00	
Gillett, John.....'92	5 00	7 50
Gilpin, Henry B.....'93	5 00	
Girling, Robert N.....'93	5 00	
Glines, Geo. W.....'93	5 00	
Glover, William H.....'92	5 00	
Godbold, Fabius C.....'93	5 00	
Godding, John G.....'93	5 00	
Good, James M.....'92	5 00	
Gooding, Charles J.....'92	5 00	
Gooding, Robert J.....		5 00
Goodman, Chas. F.....'92–'93	10 00	
Goodrich, Stephen.....'92	5 00	
Goodwill.....'93	5 00	
Goodwin, Lester H.....'92	5 00	
Gordon, Richard H.....'92	5 00	
Gorgas, George A.....'93	5 00	
Gorman, John T. B.....'92–'93	10 00	7 50
Gosman, Adam J.....'93	5 00	
Grandjean, Charles.....'92	5 00	
Grandjean, Eugene.....'92	5 00	
Grassly, Charles W.....'92	5 00	
Gray, Henry R.....'92	5 00	
Gray, William.....'92	5 00	
Green, Benjamin.....'92	5 00	
Green, Hamer H.....'92–'93	10 00	
Green, Robert M.....'92	5 00	
Gregory, Willis G.....'92	5 00	
Greiner, William E.....'92–'93	10 00	
Greve, Chas. M.....'92–'93	10 00	
Greve, Theo. L. A.....'93	5 00	
Groetsch, Geo. W.....'92	5 00	
Gross, Edw. Z.....'92	5 00	
Grossklaus, John F.....'93	5 00	
Grosvenor, Daniel P.....'92–'93	10 00	
Gundrum, Geo.....'92	5 00	
Gurney, Chas. H.....'92	5 00	
Gutierrez, Antonio G.....'92	5 00	
Haass, G. Herman.....'93	5 00	
Haenchen, Chas. E.....'92	5 00	
Haight, Wm. B.....'92	5 00	
Hale, Chester S.....'92	5 00	5 00
Hall, Chas. E.....'92	5 00	
Hall, Charles K.....'92	5 00	
Hall, Edwin B.....'93	5 00	
Hall, Marshall C.....'92–'93	10 00	
Hall, Wm. A.....'92	5 00	
Hallberg, Carl S. N.....'92	5 00	
Hance, Edw. H.....'93	5 00	
Hancock, Chas. W.....'93	5 00	
Hancock, Franklin W.....'92	5 00	
Hancock, J. Henry.....'92	5 00	
Hanson, Arthur E.....'92	5 00	
Hanson, Willis T.....'92	5 00	
Hardigg, Wm. L.....'92	5 00	
Hardin, John H.....'92	5 00	
Harding, Lawrence A.....'92	5 00	5 00
Hardy, Cyrus D.....'92	5 00	
Harrington, Frank.....'92	5 00	
Harris, Chester C.....'92	5 00	7 50
Hartshorn, Frederick A.....'93	5 00	
Hartwig, Charles F.....'92	5 00	
Hartwig, Otto J.....'92–'93	10 00	
Amount carried forward.....	$2385 00	$105 00

	Annual Dues.	Certificates.
Amount brought forward.....	$2385 00	$105 00
Harvey, John M.....'92	5 00	
Hassebrock, Henry F.....'92	5 00	
Hassinger, Samuel E. R.....'93	5 00	
Hassler, Alfred J.....'92	5 00	
Hattenhauer, Robert C. .....'93	5 00	
Haussamen, Henry L.....'92	5 00	
Hawkins, M. Smith.....'93	5 00	
Hay, Edw. A. .....'93	5 00	
Hayes, Horace P. .....'92–'93	10 00	
Hayes, James H. .....'92	5 00	7 50
Haynes, David O.....'92–'93	10 00	
Hays, Jos. A.....'92	5 00	
Hegeman, J. Niven.....'92	5 00	
Heinstreet, Edward B.....'92–'93	10 00	
Heinemann, Otto .....'92	5 00	
Heintsh. Sigmund W.....'92–'93	10 00	
Helke, Wm. L. .....'93	5 00	
Heller, Geo. G. .....'92–'93	10 00	
Helmann, Otto .....'92	5 00	
Hemm, Francis.....'92	5 00	
Henderson, Archibald K.....'93	5 00	
Hening, James C.....'92	5 00	
Hepburn, John.....'92–'93	10 00	
Herbst, Frederick W. .....'93	5 00	
Hermann, John G.....'92	5 00	
Hervey, James.....'92–'93	10 00	
Hess, Paul L.....'92	5 00	
Heydenreich, Emile.....'92	5 00	
Higby, Wm. H.....'92–'93	10 00	
Higgins, James S.....'93	5 00	
Hilby, Francis M.....'92	5 00	
Hildreth, Newton G.....'92	5 00	
Hill, Justin L.....'92	5 00	
Hilton, Samuel L.....'93	5 00	
Hiriart, Sebastian.....'93	5 00	
Hitchcock, John E. .....'92	5 00	
Hobbs, William.....'92	5 00	
Hodges, J. Walter .....'93	5 00	
Hoenny, Adolph J.....'92	5 00	
Hoffman, Julius.....'92–'93	10 00	
Hogan, John J.....'92	5 00	
Hogan, Louis C.....'92	5 00	
Hogey, Julius H. .....'92	5 00	
Hollister, Albert H..... ....'93	5 00	
Holmes, Clay W. .....'93	5 00	
Hohnes, Henry E.....'92	5 00	
Homer, John.....'92	5 00	
Hood, Charles I.....'93	5 00	
Hood, John W.....'92	5 00	
Hopp, Lewis C.....'93	5 00	
Horne, Henry R.....'92	5 00	
Hoskinson, J. Thomas, Jr. '92–'93	10 00	
Howland, Edgar J.....'92–'93	10 00	7 50
Howson, Arthur B. .....'93	5 00	
Howson, Walter H.....'93	5 00	
Hoyt, Geo. M.....'92–'93	10 00	
Hubert, Ernest .....'92	5 00	
Hudson. Arthur.....'92	5 00	
Huecker, John .....'92	5 00	
Huested, Alfred B.....'92–'93	10 00	
Huhn, George .....'92	5 00	
Hunt, Denis D.....'92	5 00	
Hunt, Leonard W.....'91–'92	10 00	
Hunter, Buxton W.....'92	5 00	
Huntington, William H.....'93	5 00	
Hurd, John C. .....'92–'93	10 00	
Huston, Charles .....'93	5 00	
Hutton, Harry D. .....'93	5 00	
Hydren, Carl.....'92	5 00	
Hyler, Wm. H.....'92	5 00	
Hynard, Eugene R.....'92	5 00	
Ingalls, Albert O.....'92	5 00	
Ingalls, John .....'92	5 00	
Inglis, Frank .....'92	5 00	
Ink, Charles E.....'92	5 00	
Amount carried forward.....	$2835 00	$120 00

	Annual Dues.	Certificates.
Amount brought forward.....	$2835 00	$120 00
Irvin, William A.....'93	5 00	
Jackson, Edw. C.....'91–'92	10 00	
Jacobs, Frederick L.....'92–'93	10 00	
James, Wm. T.....'92	5 00	
Jamieson, Thos. N. .....'92	5 00	
Jenkins, Luther L.....'93	5 00	
Jennings, N. Hynson.....'92–'93	10 00	
Jesson, Jacob.....'92	5 00	
Johnson, Arthur S.....'92	5 00	
Johnson, Frank W.....'92	5 00	
Johnson, John.....'92	5 00	
Johnston, Harry A.....'93	5 00	
Jones, Alexander H.....'93	5 00	
Jones, Daniel S. .....'92	5 00	
Jones, James H.....'92	5 00	
Jones, John, Jr.....'93	5 00	
Jones. Samuel S.....'92	5 00	
Jones, Simon N.....'92	5 00	
Jordan, Francis.....'92	5 00	
Judisch, George.....'92	5 00	
Jungkind, John A.....'92	5 00	
Kadlec, Lawrence W.....'91–'92	10 00	
Karb, Geo. J.....'93	5 00	
Kauffman, Geo. B.....'93	5 00	
Kearfott, Clarence P.....'92	5 00	
Keefer, Chas. D.....'93	5 00	
Keene, Thomas R.....'92	5 00	
Keeney, Caleb R.....'92	5 00	
Keith, Irwin A.....'92	5 00	
Kelley, Edward S.....'93	5 00	
Kelly, George A. .....'93	5 00	
Kennedy, Ewen C.....'92	5 00	
Kennedy, Ezra J.....'92	5 00	
Kennedy, Geo. W.....'93	5 00	
Kenney, Herbert E.....'92	5 00	
Kent, Henry A., Jr.....'92	5 00	
Keppler, Charles L.....'92	5 00	
Keppler, Christian L. .....'92	5 00	
Kerr, Frank G.....'92	5 00	
Kerr, Wm. W.....'92	5 00	
Kieffer, George .....'92	5 00	
Kilmer, Frederick B.....'92	5 00	
King, Geo. A. N. .....'92	5 00	
Kinnear, James A.....'92	5 00	
Kirchgasser, Wm C.....'93	5 00	
Kirchhofer, Paul..... '92	5 00	
Kirkland, Derwentwater.....'92	5 00	
Klauber, Charles N.....'93	5 00	
Klayer, Louis.....'92	5 00	
Klie, G. H. Chas.....'92	5 00	
Kline, Mahlon N.....'93	5 00	
Knabe, Gustavus A.....'92	5 00	
Knock, Thos. F. .....'93	5 00	
Knoebel, Thos.....'92–'93	10 00	
Knoefel, August .....'92	5 00	
Knudsen, Rudolph H. .....'92–'93	10 00	
Koch, Julius A. .....'92–'93	10 00	
Koch, Louis .....'93	5 00	
Kochan, John.....'92	5 00	
Koehnken, Herman H.....'92	5 00	
Koenigstein, Daniel J.....'92	5 00	
Kostka. Bruno O.....'93	5 00	
Kraemer, Henry.....'92	5 00	
Kremers, Edward.....'93	5 00	
Krewson, Wm. E. .....'92	5 00	
Krieger, Philip.....'93	5 00	
Krosskop, Wm. B.....'93	5 00	
Kuhn, Norman A.....'92–'93	10 00	
Kurfurst, Henry F. .....'93	5 00	
La Pierre, Elie H.... ....'92–'93	10 00	
La Rue, Wm. I.....'92–'93	10 00	7 50
Lachance, Seraphin .....'93	5 00	
Lahme, Chas. A.....'92	5 00	
Laing, Alfred A. .....'93	5 00	
Lalmant, Eugene.....'92	5 00	
Amount carried forward.....	$3260 00	$127 50

	Annual Dues.	Certificates.
Amount brought forward.....	$3260 00	$127 50
Lampa, Robert R. .....'92	5 00	
Last, Louis.....'93	5 00	
Lauer, Michael J. .....'91–'92	10 00	
Lavigne, Jean B. .....'93	5 00	
Layton, Thomas .....'92	5 00	
Leavitt, Miner L. H.....'92	5 00	
Leenheer, Bastian.....'92	5 00	
Legendre, Jos. A.....'92	5 00	
Lehr, Philip .....'93	5 00	
Leis, Geo. .....'92	5 00	
Leist, Jacob L. .....'93	5 00	
Leonardi, Sidney B.....'92	5 00	
Leonhard, Rudolph E. .....'92	5 00	
Lenhart, August.....'93	5 00	
Levy, Adolph.....'92	5 00	
Lewis, Ernest G.....'92	5 00	
Libby, Henry F.....'92	5 00	
Lightstone, Wm. H. .....'92	5 00	
Lilly, Eli.....'93	5 00	
Lilly, Josiah K.....'93	5 00	
Lillybeck, Oscar.....'92–'93	10 00	
Livingston, Barent V. B.....'93	5 00	
Llewellyn, John F.....'92	5 00	
Lloyd, John U.....'93	5 00	
Loehr, Theodore C.....'92	5 00	
Loelkes, Alexander G.....'92	5 00	
Long, Jonathan C.....'92	5 00	
Loomis, John C.....'93	5 00	
Lord, Thomas .....'93	5 00	
Loveland, Charles H. .....'92	5 00	5 00
Lovis, Henry C.....'92	5 00	
Lowd, John C.....'93	5 00	
Lyman, Asahel H.....'92	5 00	
Lyneman, Felix A.....'92	5 00	
Lyons, Isaac L. .....'92–'93	10 00	
Macdonald, Daniel T.....'92	5 00	
Maclagan, Henry.....'92	5 00	
Maclise, James .....'92	5 00	
Macmillan, Andrew J. .....'92	5 00	
Macy, Sherman R. .....'92–'93	10 00	
Maghee, Thos. G.....'92	5 00	
Maine, August .....'92–'93	10 00	
Maisch, Henry C. C.....'92	5 00	
Majer, Oscar .....'92	5 00	
Major, Alphonse.....'92	5 00	
Major, John R.....'93	5 00	
Mallinckrodt, Edward.....'92	5 00	
Mann, Albert.....'93	5 00	
Manning, John H.....'92–'93	10 00	
Markoe, Geo. F. H.....'93	5 00	
Marshall, Ernest C.....'93	5 00	
Martin, Hugo W. C.....'90–'91	10 00	
Martin, Robert R. .....'92	5 00	
Mason, Alfred H. .....'92–'93	10 00	
Massey, Wm. M. .....'92	5 00	
Matkin, Geo. G. .....'92	5 00	
Mattingly, Geo. J.....'92–'93	10 00	
May, Eugene .....'92–'93	10 00	
May, James O. .....'93	5 00	
Mayer, John F.....'92	5 00	
McAfee, John J.....'92	5 00	
McClure, Wm. H.....'92–'93	10 00	
McColgan, Adam T.....'92–'93	10 00	
McComas, Percy G.....'92–'93	10 00	
McDonald, George.....'92	5 00	
McElhenie, Thomas D....'92–'93	10 00	
McElwee, Emer J.....'93	5 00	
McFarland, Andrew.....'92	5 00	
McFarland, Geo. F. .....'92–'93	10 00	
McIntire, Byron F. .....'92	5 00	
McIntire, Ewen.....'92	5 00	
McIntyre, William.....'93	5 00	
McKesson, G. Clinton.....'92	5 00	
McKesson, John, Jr.....'93	5 00	
McMichael, Americus O.....'92	5 00	7 50
Amount carried forward.....	$3710 00	$140 00

	Annual Dues.	Certificates.
Amount brought forward.....	$3710 00	$140 00
McNeil, John M. .....'93	5 00	
Means, John C.....'92	5 00	
Mehl, Henry W.....'92	5 00	
Meininger, Albert .....'92–'93	10 00	
Meissner, F. W., Jr .....'92	5 00	
Melvin, Samuel H.....'92	5 00	
Mendoza, Francis F. .....'92	5 00	
Merrell, Ashbel H.....'92	5 00	
Meyer, Christian F. G.....'92	5 00	
Michaelis, Gustavus .....'92–'93	10 00	
Miller, Adolph W. .....'93	5 00	
Miller, Jacob A. .....'93	5 00	
Miller, James M. .....'92	5 00	
Miller, Jason A. .....'93	5 00	
Miller, Jos. G.....'92	5 00	
Milligan, Decatur.....'93	5 00	
Miner, Maurice A.....'92	5 00	
Miner, Mrs. Mary O. .....'92	5 00	
Mittelbach, William.....'93	5 00	
Miville, Francis C.....'92	5 00	
Mohr, Charles .....'92	5 00	
Moody, Richard H.....'92	5 00	
Moore, Chas. G.....'92	5 00	
Moore, George.....'93	5 00	
Moore, Joachim B. .....'92–'93	10 00	
Moore, John T.....'93	5 00	
Moore, Silas H.....'92	5 00	
Moore, Thos. F. .....'92	5 00	
Morgan, Aylmer L.....'93	5 00	5 00
Morgan, Eugene H.....'92	5 00	7 50
Morland, Robert L.....'92	5 00	
Morris, Lemuel I. ....'91–'92–'93	15 00	
Morris, Wm. G.....'92	5 00	
Morrison, Jos. E. .....'92	5 00	
Morse, C. Milan .....'93	5 00	
Moulton, Daniel P.....'93	5 00	
Mowry, Albert D.....'93	5 00	
Mueller, Adolph .....'93	5 00	
Mueller, Otto E.....'92	5 00	
Munson, James H.....'92–'93	10 00	7 50
Munson, Luzerne I.....'92	5 00	
Murphy, John J.....'92	5 00	
Myers, Daniel .....'93	5 00	
Myhre, Olaus G.....'92	5 00	7 50
Neathery, James M.....'92	5 00	5 00
Neppach, Stephen A.....'92	5 00	
Newbold, Thomas M. .....'92	5 00	
Newman, Geo. A.....'92	5 00	
Newton, Philo G. .....'92	5 00	
Nichols, Thos. B. .....'92–'93	10 00	
Nipgen, John A.....'93	5 00	
Nisbet, Wm. W.....'92	5 00	
Noll, Matthias.....'93	5 00	
Nowers, Lawrence E.....'92–'93	10 00	5 00
O'Brien, James J. .....'92–'93	10 00	
Oberdeener, Samuel.....'93	5 00	
Oglesby, Geo D. .....'92	5 00	
Ohliger, Lewis P. .....'92	5 00	
Oldberg, Oscar .....'92	5 00	
Oliver, Wm. M. .....'93	5 00	
Orton, Ingomar F.....'93	5 00	
Otis, Clark Z.....'92	5 00	
Ottinger, James J. .....'93	5 00	
Otto, John N. W.....'92	5 00	
Owens, James A. .....'93	5 00	
Owens, Richard J.....'93	5 00	
Parcher, Geo. A.....'93	5 00	
Parisen, Geo. W.....'92–'93	10 00	
Parker, Arthur S.....'92	5 00	
Parkill, Stanley E.....'92	5 00	
Parrott, John E. .....'92	5 00	
Parsons, John .....'93	5 00	
Partridge, Chas. K. .....'92	5 00	
Patch, Edgar L. .....'93	5 00	
Patterson, Theodore H....'92–'93	10 00	
Amount carried forward.....	$4140 00	$177 50

	Annual Dues.	Certificates.
Amount brought forward.....	$4140 00	$177 50
Pattison, Chas. H.....'92	5 00	
Patton, John E.....'92	5 00	
Patton, John F.....'93	5 00	
Patton, Joseph.....'92	5 00	
Pauley, Frank C.....'92	5 00	
Peacock, Josiah C.....'92	5 00	
Pease, Francis M.....'93	5 00	
Percy, Wm. G.....'92	5 00	
Perham, Henry A.....'92	5 00	
Perkins, Benj. A.....'93	5 00	
Perkins. Chas. W.....'92	5 00	
Perkins, Wm. A.....'93	5 00	
Perry, Fred. W. R.....'92	5 00	
Petsche, Bismarck W.....'92	5 00	
Pettit, Henry M.....'93	5 00	
Peyton, Robert D.....'92	5 00	
Pfafflin, Henry A.....'92-'93	10 00	
Pfingst, Edw. C.....'92	5 00	
Pfunder, Wm.....'92	5 00	
Phelps, Dwight.....'93	5 00	
Phillips, Chas. W.....'93	5 00	
Phillips, Edwin F.....'93	5 00	
Physick, Henry S.....'92	5 00	
Pickett, John H.....'93	5 00	
Pieck, Edw. L.....'92	5 00	
Pierce, Wm. H.....'93	5 00	
Pile, Gustavus.....'93	5 00	
Pitt, John R., Jr.....'93	5 00	
Plummer, David G.....'92	5 00	
Plummer, Edw.....'92	5 00	
Plummer, Jos. W.....'92	5 00	7 50
Poehner, Adolph A.....'92-'93	10 00	
Porter, Chilton S.....'92	5 00	
Porter, Henry C.....'92-'93	10 00	
Porter, Louis F.....'92-'93	10 00	5 00
Porter, Martin L.....'92-'93	10 00	
Porter, Millett N.....'92	5 00	7 50
Powell, Robert B.....'93	5 00	
Powell, Thos. W.....'92	5 00	
Power, Frederick B.....'92-'93	10 00	
Prall, Delbert E.....'93	5 00	
Prescott, Albert B.....'92-'93	10 00	
Prescott, Horace A.....'92	5 00	
Preston, Andrew P.....'93	5 00	
Preston, David.....'92-'93	10 00	
Price, Charles H.....'92-'93	10 00	
Price, Joseph.....'92-'93	10 00	
Prieson, Adolph.....'92	5 00	
Procter, Wallace.....'93	5 00	
Puckner, Wm. A.....'93	5 00	
Punch, Wm. F.....'91-'92	10 00	
Purcell, Nicholas S.....'92	5 00	
Pursell, Howard.....'93	5 00	
Pyle, Cyrus.....'91-'92	10 00	
Rademaker, Herman H.....'92	5 00	
Rand, Daniel M.....'92	5 00	
Rapelye, Chas. A.....'92	5 00	
Ray, Frederick E.....'92	5 00	
Ray, Peter W.....'92	5 00	
Redsecker, Jacob H.....'92	5 00	
Reed, Chas. C.....'92	5 00	
Renz, Frederick J.....'92	5 00	
Reynolds, Chas. E.....'92-'93	10 00	
Reynolds, Howard P.....'93	5 00	
Reynolds, John J.....'92	5 00	
Reynolds, Wm. K.....'92	5 00	
Rhode, Rudolph E.....'93	5 00	
Rich, Willis S.....'92	5 00	
Richardson, Horatio S....'92-'93	10 00	
Richter, Gustave A.....'92-'93	10 00	
Ricksecker, Theodore.....'92	5 00	
Riddell, Benj. F.....'92-'93	10 00	
Ridgway, Lem. A..'89-'90-'91-'92	20 00	
Riesenmann, Jos.....'92	5 00	
Riggs, Wm. E.....'92	5 00	
Amount carried forward.....	$4610 00	$197 50

	Annual Dues.	Certificates.
Amount brought forward.....	$4610 00	$197 50
Riley, Chas. W.....'92	5 00	
Robbins, Alonzo.....'92-'93	10 00	
Robert, Wm. H., Jr.....'92	5 00	7 50
Roberts, Daniel J.....'92	5 00	
Roberts, William.....'92-'93	10 00	5 00
Robertson, Felix O.....'93	5 00	
Robin, Oscar.....'92	5 00	
Robins, Wilbur F.....'92	5 00	5 00
Robinson, Edw. A.....'93	5 00	
Robinson, Ernest F.....'92	5 00	
Robinson, Wm. A.....'92-'93	10 00	
Rockefeller, Lucius.....'93	5 00	
Rogers, Arthur H.....'92	5 00	
Rogers, Wiley.....'92	5 00	
Rogers, Wm. H.....'92	5 00	
Rohde, Claus F.....'92	5 00	
Rosewater, Nathan ...'90-'91-'92	15 00	
Ross, Samuel P.....'92	5 00	
Rowlinski, Robert A.....'92	5 00	
Rudolf, Eliza.....'92	5 00	
Ruenzel, Henry G.....'92-'93	10 00	
Ruete, Theo. W.....'92	5 00	
Ruppert, John .....'92-'93	10 00	
Rust, William.....'93	5 00	
Ryan, Frank G.....'92	5 00	
Ryan, Henry.....'92	5 00	5 00
Ryerson, Henry O.....'93	5 00	
Sanderson, Stephen F.....'92	5 00	
Sargent, Ezekiel H.....'92	5 00	
Sargent, Jesse W.....'92-'93	10 00	
Sauer, Louis W.....'92	5 00	
Sauerhering, Rudolph A.....'93	5 00	
Saunders, Wm.....'92-'93	10 00	
Sautter, Louis.....'9 -'93	10 00	
Sayre, Edw. A.....'90-'91-'92	15 00	
Sayre, Eugene A.....'92	5 00	
Sayre, Lucius E.....'93	5 00	
Schaap, John.....'92	5 00	
Schafhirt, Adolph J.....'93	5 00	
Scheffer, Emil.....'92	5 00	
Scheffer, Henry W.....'93	5 00	
Scherer, Andrew.....'92-'93	10 00	
Scherff, John P.....'93	5 00	
Schieffelin, Wm. J.....'92	5 00	
Schiemann, Edw. B.....'92	5 00	
Schlaepfer, Henry J.....'93	5 00	
Schley, Steiner.....'92	5 00	
Schlotterbeck, Julius O.....'93	5 00	
Schmidt, Carl.....'92	5 00	
Schmidt, Florian C.....'93	5 00	
Schmidt, Fred. M.....'92	5 00	
Schmitt, Geo. J. F.....'93	5 00	
Schmitt, Jos. M.....'93	5 00	
Schmitter, Jonathan.....'92	5 00	
Schoenhut, Christie H. ...'92-'93	10 00	
Schoettlin, Albert J.....'92	5 00	
Scholtz, Edmund L.....'92	5 00	
Schrader, Herman V. R.....'92	5 00	
Schranck, C. Henry.....'93	5 00	
Schreck, Leo. S.....'93	5 00	
Schueller, Ernst.....'93	5 00	
Schueller, Fred. W.....'93	5 00	
Schulze, Louis.....'92-'93	10 00	
Schurk, Louis.....'92	5 00	
Schwab, Leslie W.....'92-'93	10 00	
Scott, Geo. T.....'92	5 00	
Scott, James M.....'92	5 00	7 50
Scoville, Chas. H.....'92-'93	10 00	
Scoville, Wilbur L.....'93	5 00	
Scull, James H.....'92	5 00	
Sempill, Walter M.....'92	5 00	
Sennewald. Ferd. W.....'92	5 00	
Shake, Homer C.....'92-'93	10 00	5 00
Shannon, Thomas R .....'92	5 00	
Sharp, Harry.....'92	5 00	
Amount carried forward.....	$5075 00	$232 50

	Annual Dues.	Certificates.
Amount brought forward.....	$5075 00	$232 50
Sharples, Stephen P.....'93	5 00	
Shaw, Robert J.....'92	5 00	
Shelton, Wm. A.....'92–'93	10 00	
Shelton, Wm. C.....'92	5 00	
Sherman, Chas. R.....'92–'93	10 00	
Sherwin, Eugene A.....'93	5 00	
Sherwood, Louis W.....'93	5 00	
Shinn, James T.....'93	5 00	
Shoemaker, Richard M.....'93	5 00	
Shreve, John A.....'92	5 00	
Shriver, Henry.....'92	5 00	
Shryer, Thos. W.....'92	5 00	
Siegmund, Chas. A.....'92–'93	10 00	
Siegenthaler, Harvey N.....'93	5 00	
Siekman, Ivan F.....'92	5 00	
Simms, Giles G. C.....'93	5 00	
Simon, William.....'93	5 00	
Simons, Arthur H.....'92–'93	10 00	5 00
Simpson, William.....'92	5 00	
Simson, Francis C.....'92	5 00	
Sippy, Alvin H.....'92	5 00	
Slack, Henry R., Jr.....'92	5 00	
Slater, Frank H.....'93	5 00	
Sleuman, Chas. A., Jr.....'92	5 00	
Sloan, Geo. W.....'93	5 00	
Slocum, Frank L.....'92	5 00	
Smink, Wm. H. R.....'92	5 00	
Smith, A. Henry.....'92	5 00	
Smith, Amasa D.....'93	5 00	
Smith, B. Frank.....'92	5 00	
Smith, Edward N.....'93	5 00	
Smith, Frank R.....'92	5 00	
Smith, Geo. S.....'92	5 00	
Smith, J. Hungerford.....'92	5 00	
Smith, John C.....'92–'93	10 00	
Smith, Lauriston S.....'92–'93	10 00	
Smith, Linton.....'93	5 00	
Smith, Linville H.....'92	5 00	
Smith, Samuel W.....'93	5 00	
Smith, Theodoric.....'92	5 00	
Smith, Whitefoord G.....'92–'93	10 00	
Sniteman, Chas. C.....'92	5 00	
Snow, Chas. W.....'93	5 00	
Snow, Herbert W.....'92–'93	10 00	
Snyder, Alva L.....'92	5 00	
Snyder, Robert J.....'92	5 00	
Soetje, Edward C.....'92	5 00	
Sohn, Frank.....'92	5 00	
Sohrbeck, G. Henry.....'92	5 00	
Sombart, John E.....'92	5 00	
Spalding, Warren A.....'93	5 00	
Spangler, H. W.....'92	5 00	
Spengler, John G.....'92	5 00	
Sperry, Herman J.....'93	5 00	
Spofford, Chas. B.....'92	5 00	
Squibb, Edw. H.....'93	5 00	
Squibb, Edw. R.....'93	5 00	
Squires, Geo. B.....'92	5 00	
Staebler, Richard.....'92	5 00	
Stahler, William.....'93	5 00	
Stam, Colin F.....'92	5 00	
Stanley, Edgar C.....'92	5 00	
Staudt, Louis C.....'93	5 00	
Stearns, Henry A.....'93	5 00	
Stebbins, Harry F.....'92	5 00	
Stedem, Fred. W. E.....'92–'93	10 00	
Steele, Geo. R.....'92–'93	10 00	
Stein, Jacob H.....'92	5 00	
Stendel, Guthardt.....'92	5 00	
Stevens, Alonzo B.....'92	5 00	
Stevens, Fred. D.....'92	5 00	
Stevens, Luther F.....'90–'91	10 00	
Stoff, Louis.....'92	5 00	
Stone, Marion M.....'92	5 00	
Storck, Jacob A.....'92	5 00	
Amount carried forward.....	$5505 00	$237 50

	Annual Dues.	Certificates.
Amount brought forward.....	$5505 00	$237 50
Stoughton, Dwight G.....'92	5 00	
Stowell, Daniel.....'92	5 00	
Strater, Henry H.....'92	5 00	
Strathman, Chas. A.....'92	5 00	
Sumner, Alphonso.....'92–'93	10 00	
Sweet, Caldwell.....'93	5 00	
Tailby, Joseph A.....'92	5 00	
Tartiss, Alfred J.....'92	5 00	
Taylor, Celia W.....'92	5 00	
Taylor, Geo. A.....'92	5 00	
Taylor, Thomas L.....'92	5 00	7 50
Taylor, Walter T.....'92	5 00	
Thatcher, Harvey D.....'92–'93	10 00	
Thomas, Robert, Jr.....'92	5 00	
Thomasson, Anders.....'92–'93	10 00	
Thompson, William S.....'93	5 00	
Thompson, William S.....'92	5 00	
Thomsen, John J., Jr.....'93	5 00	
Thorn, Henry P.....'93	5 00	
Thurber, Almon R.....'91	5 00	
Tiarks, Herman.....'93	5 00	
Tigner, James O.....'92	5 00	
Tilden, Amos K.....'92	5 00	
Tobey, Chas. W.....'91–'92	10 00	
Tobin, John M.....'92	5 00	
Tomfohrde, Chas. W.....'92	5 00	
Tomfohrde, John W.....'92	5 00	
Topley, James.....'93	5 00	
Torbert, Willard H.....'93	5 00	
Tracy, David W.....'92	5 00	7 50
Travis, Miles B.....'92	5 00	
Trimble, Henry.....'93	5 00	
Truax, Charles.....'93	5 00	
Trudel, Jacques J.....'92	5 00	
Tucker, Mosely F.....'92	5 00	
Tuma, Bruno.....'93	5 00	
Turner, Geo. H.....'92–'93	10 00	
Tyner, Chas. O.....'92	5 00	
Uhlich, Ferdinand G.....'92	5 00	
Upson, Rosa.....'92	5 00	
Urban, Jacob P.....'92–'93	10 00	
Valliant, Geo. E.....'93	5 00	
Van Antwerp, Andrew.....'92	5 00	
Van Antwerp, Garet.....'92	5 00	
Van Auken, Jerrie A.....'92	5 00	
Vandegrift, John A.....'92	5 00	
Van Patten, W. J.....'92	5 00	
Vargas, Jorge.....'92–'93	10 00	
Varney, Edw. F.....'92	5 00	
Vaughan, Parry W.....'92	5 00	
Viallon, Paul L.....'90	5 00	
Vilter, Hermann T.....'93	5 00	
Vogt, John G.....'92	5 00	
Vordick, August H.....'92	5 00	
Voss, Geo. W.....'93	5 00	
Wagner, Henry.....'93	5 00	
Wagner, Wm. I.....'92–'93	10 00	
Wakefield, Seth D.....'92	5 00	
Walbrach, Arthur.....'93	5 00	
Walch, Robert H.....'92	5 00	
Walker, Chas. W.....'92	5 00	
Walker, John P.....'93	5 00	
Walker, Wm. I.....'92–'93	10 00	
Wall, Otto A.....'92	5 00	
Wangler, Conrad D.....'93	5 00	
Ward, Chas. A.....'93	5 00	
Warn, Wm. E.....'93	5 00	
Warren, Edwin A.....'92	5 00	
Warren, Wm. M.....'92	5 00	
Watson, Herbert K.....'92	5 00	
Watson, Sidney P.....'92	5 00	
Watson, Wm. S.....'92	5 00	
Waugh, Geo. J.....'92	5 00	
Wearn, Wm. H.....'92	5 00	
Weaver, John A.....'92	5 00	
Amount carried forward.....	$5925 00	$252 50

	Annual Dues.	Certificates.
Amount brought forward.....	$5925 00	$252 50
Webb, Wm. H.....'93	5 00	
Webber, J. Le Roy .....'93	5 00	
Weber, Eugene .....'92	5 00	
Weeks, B. Frank.....'92	5 00	
Wehrly, Thos. M.....'93	5 00	
Weiser, Emilius I.....'93	5 00	
Wellcome, Henry S...'91–'92–'93	15 00	
Wendel, Henry E.....'93	5 00	
Werner, Rudolf C.....'92	5 00	
West, Chas. A.....'92–'93	10 00	
Westmann, Frank H. .....'92	5 00	
Wetherell, Albert S. .....'92–'93	10 00	
Wetterstroem, Albert.....'92	5 00	
Weyer, John.....'92–'93	10 00	
Whall, Joseph S.....'92	5 00	
Wheat, Eli M. .....'92	5 00	
Wheeler, C. Gilbert .....'92	5 00	
Wheeler, Wm. D.....'92	5 00	
Whelpley, Henry M.....'92	5 00	
Whitcomb, Frederick E.....'92	5 00	
Whiting, Frederick T.....'93	5 00	
Whitman, Nelson S.....'93	5 00	
Whitney, Henry M.....'93	5 00	
Wichelns, Frederick.....'93	5 00	
Wickham, Wm. H. .....'93	5 00	
Wienges, Conrad .....'92	5 00	
Wight, Oscar M.....'92	5 00	
Wilcox, Frederick.....'92	5 00	
Wilder, Geo. P.....'92	5 00	
Willett, G. Howard .....'92	5 00	
Williams, Chas. F.....'92	5 00	
Williams, Duane B.....'92	5 00	
Williams, Edward M. .....'92	5 00	
Amount carried forward.....	$6115 00	$252 50

	Annual Dues.	Certificates.
Amount brought forward.....	$6115 00	$252 50
Williams, George G. .....'92	5 00	
Williams, John K. .....'92	5 00	
Williams, Richard W.....'92–'93	10 00	
Williams, Seward W.....'92	5 00	
Williams, Wm. H. .....'92	5 00	
Wills, Fred. M.....'92	5 00	
Wilson, Benj. O.....'93	5 00	
Wilson, Frank M.....'92–'93	10 00	
Winnberg, John M.....'92	5 00	
Winters, John H.....'90–'91–'92	15 00	
Wolfe, Nathaniel .....'92	5 00	
Wood, Alonzo F., Jr.....'93	5 00	
Wood, Edw. S.....'93	5 00	
Wood, Geo. M.....'92	5 00	
Wood, James P.....'93	5 00	
Wood, Mason B.....'92	5 00	
Woodruff, Roderick S.....'92	5 00	
Wooldridge, Daniel T.....'93	5 00	
Wray, George B.....'93	5 00	
Wright, Albert F.....'92	5 00	
Wunderlich, Edward.....'92	5 00	
Wurmb, Theodore H.....'92	5 00	
Yocom, Albert L.....'92	5 00	5 00
Young, John K.....'92	5 00	
Youngs, William. .....'92	5 00	
Zahn, Emil .....'92	5 00	
Zellhoefer, George.....'92	5 00	
Ziegler, Philip M.....'93	5 00	
Zimmer, Harry E.....'92	5 00	
Zimmerman, Chas.....'93	5 00	
Zoeller, Edward V.....'92	5 00	
Zuenkeler, J. Ferd.....'93	5 00	
Zwick, Geo. A. .....'93	5 00	
Totals.....	$6300 00	$257 50

ANNUAL REPORT

ON THE

PROGRESS OF PHARMACY.

From June 30, 1892, to July 1, 1893.

By Henry Kraemer.

INTRODUCTORY.

The Reporter has endeavored to make this, like the previous Reports, a complete work of reference on pharmaceutical and allied subjects, making extended abstracts only in those cases in which it seemed that the consulting practitioner would require the information at once. In the consultation of this Report, the name of the author and journals will often characterize the value of the article. The Reporter desires to thank all those who have assisted him by consultation, advice, and by sending him their publications. He hopes for a continuation of such support and assistance, whereby the Report may become a complete and practical work of reference.

The arrangement of the contents of this Report is somewhat different from previous Reports, and it is hoped will facilitate its use. The following is an index of headings:

I. Pharmacy.

PHARMACY.

Apparatus and Manipulations.

Absorption—And Washing Apparatus.—C. Mann, Zeitschr. f. anal. Chem., 1893, 186.

Air Bath.—M. Kaehler describes an apparatus permitting the circulation of air.—Chem. Zeit., 1893, 396.

——— C. Lonnes, in Chem. Zeit., 1893, 502; H. Löndahl, Ibid., 503.

——— *A New.*—White and Bennett, in Jour. Anal. and App. Chem., 5, 355.

Drying Oven—New.—Kaehler.—Ber. d. Chem. Ges., xxv., 3612.

Aluminum Apparatus in the Laboratory.—Bornemann describes the efficiency and appearance of air and water baths, rings, clamps, etc., made of aluminum.—Ber. d. Chem. Ges., xxv., 3637.

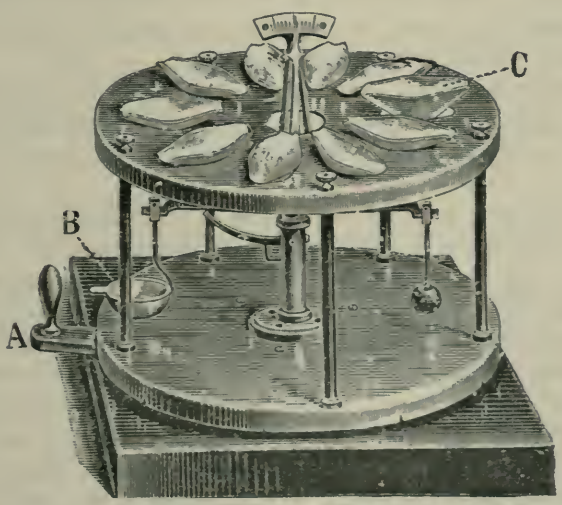
Universal-Aräometer—Pharmaceutical.—Pharm. Centralb., 1893, 180.

Alcoholometers of Precision.—J. A. Müller finds that certain alcoholometers under official control and guaranteed as exact by dealers, indicate as a mean 0.2 to 0.3 per cent. less alcohol than the quantity deduced from the densities.—Bull. Soc. Chim. de Paris, 1892, No. 14.

Apparatus—Receiving and Unpacking.—Thos. Warwick.—Bull. Pharm., 1893, 152.

Packing Drugs and Medicines.—Bull. Pharm., 1892, 581.

Fig. 33.



Dispensing Scale

Dispensing Scale—A New.—In Pharm. Zeitg.; Meyer Bros. Drug., 1892, 281, a new scale, known as Nithack's Dispensing Scale, is illustrated. The peculiar feature and advantage claimed for this scale is the fact that it permits the rapid weighing off of large numbers of powders, etc., of equal weight, as in dispensing powders at the prescription counter. The simple pushing aside of a lever removes the capsule containing a weighed quantity and replaces it with an empty scale pan. The scale will weigh quantities from one centigram to ten grams.

Weighing and Price Scales.—West. Drug., 1892, 457.—An apparatus for weighing purposes has recently been patented which presents some decidedly novel features and seems capable of being of great practical value in pharmacy. As will be observed from the illustration, the apparatus consists of a double-arm, or beam, the fulcrum of which rests on knife edges as in the ordinary balance. These knife edges, owing to the peculiar construction of the beam, afford a firmer support for the latter than in ordinary balances, and in conjunction with the inferior beam and end connections give regularity to the oscillations of the balance. One end of the beam supports a pan in a manner similar to the box dispensing scale, but instead of a second pan upon the opposite end, for receiving weights, the downward pressure is effected by moving a fixed weight backward and forward on the beam. This weight is fixed in a block in the centre of the divided beam and moved back and forward by means of a screw, operated by turning a disk, or small wheel, at the extreme end of the opposite end of the beam.

By a unique arrangement the revolution of the screw inside a cylinder, as shown in the smaller illustration, rotates in certain spaces or divisions, through which not only the weight is shown, but also a scale by which may be ascertained at a glance the price of the amount of the substance weighed from its price per pound, ounce, etc.

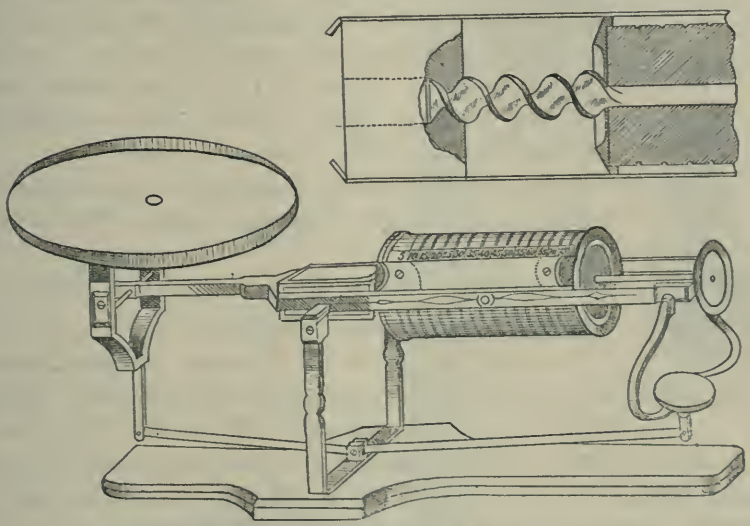
The scale is constructed for commercial purposes, of five pounds capacity to fractions of avoirdupois ounce. A small platform underneath the handwheel is intended for the placing of weights when greater capacity is desired.

It is claimed that there is scarcely any limit to the sensitiveness of a balance constructed on this principle for analytical purposes, and that by the greatest delicacy of mechanism small fractions of a milligram may easily be indicated. This is plausible when it is taken into consideration that the equilibrium is secured by moving the weight in a manner similar to that of the rider in the analytical balance; effected with much greater delicacy and accuracy in this case by means of the revolving screw.

The combination of weighing and pricing is exceedingly ingenious, and constructed according to the metric system of weights would not only be a great convenience but show the practical value of the metric system in conjunction with our decimal money, and to that extent aid in its appre-

ciation and adoption. The scale has been patented by Mr. Gustave Lundberg, of Chicago.

FIG. 34.



Lundberg's Automatic Weighing and Price Scale.

Balance—Prescription.—Improvement upon the ordinary hand scales. —Pharm. Post, 1892, 1358.

——— for Determining Percentage Changes in Weight during Evaporating, Drying, Roasting, etc.—G. W. Barth.—Zeit. f. angew. Chem.; Chem. News, 1892, 222.

——— *of Precision.*—Two balances for rapid weighing have been proposed by A. Collot, fils (Bull. Soc. Chim. de Paris, vi, 1 and 98), and V. Serrin (Compt. Rend, cxii.. 1299).

——— *How to Test a.*—Brit. and Col. Drug.; Pharm. Rev., 1893, 13.

New Weights.—Report of the k. k. Normal-Aichungs Commission.—Pharm. Post, 1893, 1364.

Bandage Machine—Plaster of Paris.—Zeitschr. Oest. Apoth. Ver., 1893, 150.

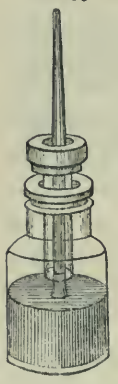
Apparatus for Reducing the Readings of the Barometer to 760 mm.—A. W. J. Boekhout.—Zeitschr. f. Anal. Chem., 1892, 666.

Bottle for Dropping of Liquids—A New.—Pharm. Post, 1893, 32.

——— *for Gum.*—This new bottle consists of four parts: a wide-mouth bottle (4 oz.), with a perforated porcelain-topped cork stopper, into which is fitted a piece of glass tubing 2¼ inches long and ⅝ inch wide, and upon this rests a porcelain top, fitted internally with a perforated india-rubber disc, through which the brush passes. The effect of the com-

bination is that the brush never becomes fixed in the top-stopper, and can at all times be raised or lowered to any level. The brush and the top-stopper are practically one, so that on lifting it the superfluous gum is wiped off in the tube, down which it flows quickly, leaving no objectionable incrustation on the top.—Chem. and Drug., 1892, 201.

FIG. 35.



Gum-Bottle.

Bottle-Emptying Device.—B. H. Gibbons, in Oil, Paint and Drug Reporter, offers a device (illus.) for drawing acids and the like.—Bull. Pharm., 1892, 472.

Glass-stoppered Bottles.—A new device is figured and described for keeping glass stoppers in bottles.—Pharm. Centralh., 1893, 333.

Poison Bottles.—H. M. Wilder.—Drug. Circ., 1893, 29.

——— Suggestions for.—(Ibid.) 50, 75.

——— *A Simple.*—B. W. Petsche. A conical-shaped cork is fastened under the bottle with sealing wax. This is fitted into a suitable container.– Pharm. Era, 1892, 143.

Protection Bottles.—V. H. Lockwood. The American Protection Bottle Co., of Marion, Ind., manufacture bottles which are sealed so that the contents cannot be reached without partially mutilating the bottle.—Bull. Pharm., 1893, 61.

Reagent Bottles—A New Stopper for.—A. Gawalowski. The bottle has a mushroom-shaped stopper to prevent dust from falling (nothing novel!) and is drawn out below to a point. A lateral cavity is ground in the lower part of the stopper to permit of the reagent being poured out in drops. The contact surfaces of the bottle and the neck are ground to prevent the stopper from sticking fast.—Chem. News, 1892, 105; from Zeitschr. f. anal. Chem., xxx, Part vi.

Bottle Shells—Cellulose for.—Conversion of raw cellulose, as it comes from the machine for the paper manufacturer, into shells for wine bottles in substitution of straw.—Commercial Agent Smith of Mayence; Pharm. Era, 1892, 330.

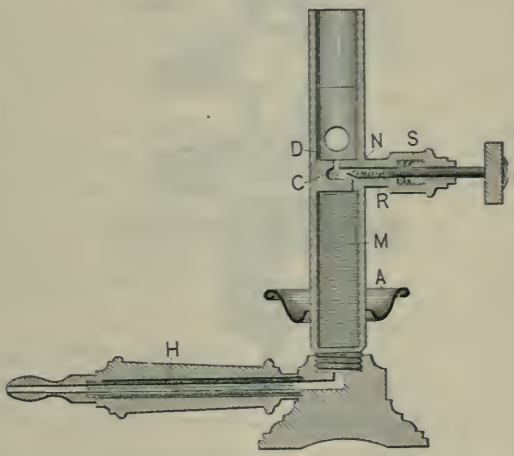
Weighing Bottle—New.—C. Mangols.—Zeitschr. f. angew. Chem., 1891, 441; Zeitschr. f. Anal. Chem., 1892, 433. Illustrated.

Stopper of Measuring Flasks for Measuring Liquids Quickly—Improved.—A. F. Reid uses a wooden or India-rubber plug which fits loosely into the neck of the flask and is of such a size that the part of it that goes into the flask has the same volume as the part of the flask above the mark. The flask is first filled up to the graduation-line with water. The stopper is inserted and then pulled out. The surplus water runs out and the proper quantity remains.—Chem. News, 1893, 159.

Burettes—To Close, without a Cock.—Dannbacher. The arrangement

consists of two perforated plates of wood rather elevated at the margin and fixed upon the ends of the burette and the outflow tube, both previously covered with a caoutchouc tube. When fixing the wooden plates the flexible tube receives a slight tension, which suffices to press the wooden plates against each other, so that after any rotation they may remain as they have last been placed.—Chem. News, 1892, 72; from Pharm. Centralh.

FIG. 36.



Bunsen Burner.

Alcohol—Bunsen Burner.—A new Bunsen burner designed by Gustav Barthel, which solves the problem of the economic use of alcohol compared to gas.—Phar. Centralh., 1862, 428.

The burner (Fig. 36) consists of a thick metal tube, supported on a foot and separated in the centre into two parts (C, D). In the upper portion the flame is generated and the heat therefrom vaporizes the alcohol in the lower portion. A uniform vapor is obtained by the interposition of a wire gauze (M), and the size of the flame is regulated by the screw (S, R) which governs the flow of vapor. The tube H conveys the alcohol to the flame and contains a sieve to filter the alcohol. The container is connected with the burner by a metallic tube.

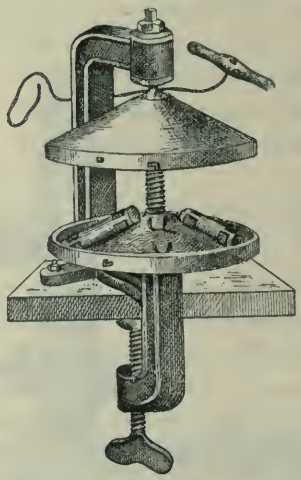
To heat 1 L. of water from a temperature of 15° C. to 100° C (59° F. to 212° F.) Barthel's alcohol Bunsen burner, after Model B, requires seven and three-fourths minutes, with a consumption of 25 gm. alcohol.—From Amer. Drug.

Burner—New Laboratory.—Teclu depicts a burner which can be used either as an ordinary Bunsen burner or a "solid flame" burner by regulating the air supply.—Jour. f. prakt. Chem., xiv., 281–286; Jour. Chem. Soc., 1892, 769. Illustration also in Pharm. Post, 1892, 1197.

Benzin Burner—G. Barthel's Wickless.—Illustration in Pharm. Post, 1893, 271 ; Zeits. Oest. Apoth. Ver., 1893, 57.

Centrifugal Apparatus for the Laboratory.—This apparatus is adapted for minor operations in the microscopical and pharmaceutical laboratory.

FIG. 37.



Centrifugal Apparatus for the Laboratory.

As shown in the cut, the tubes containing the liquids are placed on the conical bed attached to the pivoted stem, and are held securely in place by leather straps and by depressing the cover lid, which is fastened by means of a slot. The apparatus is set in motion by means of a cord, preferably gut, which is wound around the axis, the action being, of course, to and fro, as in the case of the schoolboy's buzzer. The apparatus must always be evenly and symmetrically ballasted, so as to insure even action. The best results are obtained by arresting motion every three minutes.

Among the objects frequently subjected to centrifugal action, for the purpose of separating solids from the liquid, may be mentioned milk, cream, urine, sputum, blood, fermenting liquids, etc.—Pharm. Centralh., 1892, 573.

Heynemann's Sediment Apparatus.—Application in the examination of deposits for microscopical examination in wine and drinking water; fat-estimation in butter and milk, and separation of liquids of different specific gravities.—M. Mansfeld, in Zeits. Oest. Apoth. Ver., 1893, 392. (Illustrated.)

Centrifugal in Analytical and Microscopical Work—Application of.—W. Thörner.—Chem. Zeit., 1892, 1101.

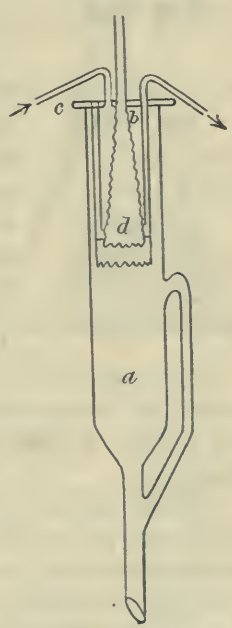
Clarification by Milk.—Tannin solutions, acid and alcoholic, particularly f containing a rather large proportion of alcohol, are readily clarified by

Foulon (*Jour. de Phar. et de Chim.*, Sept., 1892) on the addition of from 3 to 5 gm. of milk to the litre of liquid. By this means the preparation of vinous syrup of cinchona is greatly facilitated, the syrup being very limpid and retaining its clearness for a long time.—Am. Jour. Pharm., 1893, 15.

Clarifying Cider, Ale and Beer.—Pharm. Era, 1893, 141. Isinglass and fine wood shavings.

Condensing Apparatus—A Back Flow.—Donath. The glass cylinder *a* is ground flat on top so that the brass back flow condenser, which also has a carefully ground metal ring *c*, will close it up tightly. The interior condenser *d* is made of corrugated sheet brass, so as to enlarge the condensing area, and its lower edge, as well as that of the larger outer brass tube, is toothed so as to facilitate the dropping of the condensed menstruum.—Zeitschr f. angew. Chem., 1892, 355; Pharm. Centralh., 1892, 700.

FIG. 38.



Condensing Apparatus.

A Cooler.—E. Greiner constructs a vessel which is inclosed in a double glass jacket, traversed by a current of water.—Zeitschr. f. angew. Chem., 1891, 702.

Cylinders with Overflow-Vessels.—R. Frühling and J. Schulz. To prevent an overflow from cylinders used in taking the sp. gr. of fluids by means of a hydrometer, the authors proposed a concentric vessel surrounding the upper part of the cylinder. —Zeit. angew. Chem.; Zeitschr. f. anal. Chem., 1892, xxx, Part 6.

Apparatus for Decomposition and Absorption.—W. Thörner.—Zeitschr. f. angew. Chem., 1888, 487.

Decantation and Filtration Apparatus.—Saulmann.—Zeitschr. f. angew. Chem., 1892, 165.

Desiccator.—F. Soxhlet. Four illustrations. Zeitschr. f. angew. Chem., 1891, 363; Zeitschr. f. Anal. Chem., 1892, 682.

New Exsiccator.—W. Hempel places the hygroscopic agent above the substance to be dried. E. Biltz calls in question the utility of this arrangement. Hempel replies.—Zeitsch. f. anal. Chem., xxx, Part 6.

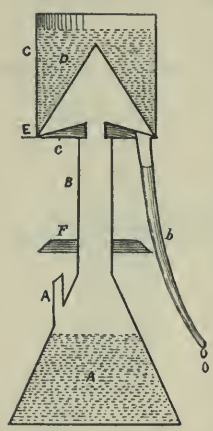
Vacuum Exsiccator Capable of being Heated.—J. W. Bruhl in Ber. d. Chem. Ges., 24, 2457.

Dialyzer.—Gautier.—Bull. Soc. Chim. de Paris, vi, No. 1; Zeitschr. f. anal. Chem., 1892, 673.

Dispensing Apparatus—The Various Styles of.—Thos. Warwick.—Bull. Pharm., 1893, 244.

Distilling Apparatus.—W. S. Swartz. In the drawing, *A* represents the boiler or receptacle for containing the water or other liquids to be distilled. This is preferably made conical so as to give it as large a heating surface as possible in proportion to its contents. This boiler is provided on one side with a filling tube *a*, through which the charge of water is introduced. Rising from the top of this boiler is a vertical standpipe, *B*, which is surmounted by a water tank *C*. In the bottom of this tank is formed a conical chamber *D*, which communicates with the boiler through the stand-pipe. The tank *C*, is designed to receive cold water, whose cooling effect on the conical chamber below serves to condense the vapor or steam into water again. This conical chamber, it will be seen, affords a larger surface to the cooling influence of the water above, and thus greatly facilitates condensation. As the vapor condenses in this conical chamber, it trickles off to a receptacle for the distilled water through the long spout *b*.

FIG. 39.



Distilling Apparatus.

E is a spigot placed in the water tank *C*, by which hot water may be drawn off from the tank when desired, for the use of the druggist, or for the purpose of refilling the tank with colder water, to facilitate condensation.

F is a flange or collar secured to the stand-pipe. The object of this flange is to protect tank *C* from heat rising from the boiler, and affords a means of sustaining the apparatus from the projecting arms of a druggist's stand when a stove is not available, and a Bunsen burner is employed for vaporizing the water, to permit the upper and lower parts of the device to be separated for cleaning the same. The pipe *B* is detatchably united to the parts *C* and *D*, by a separable screw-joint *c*.—Pacific Drug Rev.; Meyer Bros. Drug., 1893, 35.

Distillation with Superheated Steam.—Jaffe (*Ber. d. C. G.* xxvi., 123) describes an original arrangement for this purpose. At the end of a series of condensers, etc., is attached an exhaust. The distillation is conducted in a tubulated retort, through the tubulure of which passes a glass tube bent at a right angle. The open external end of this tube is close to a Bunsen burner, so that by the operation of the exhaust the flame and heated products of combustion are drawn through the liquid which is to be distilled. —S. of M. Quart., 1893, 253.

Fractional Distillation—Apparatus for.—M. Elsenberg, in Chem. Zeit., 1892, 958.

——— Clandon and Morin.—Bull. Soc. Chim. Paris, 48, 804; Zeitschr. f. anal. Chem., 1892, 299.

——— *Simplification in the Process of.*—Tigerstedt.—In order to ascertain the weight of the fractions passing over at different temperatures when the separation of the fractions is not required, the author recommends the placing of the receiver on a small balance, such as is frequently employed for letters, in which the weight is shown by means of a pointer and scale. The position of the pointer at the different temperatures is then read off, and the weight of each fraction is thus ascertained.—Ber. d. Chem. Ges., xxvi, 172.

Maris' Still and Condenser.—Illustration and description in West. Drug., 1893, 138.

The "Auto" Still.—An apparatus for the distillation of water.—Chem and Drug., 1893, 381.

Volatile Solvents—Recovery of.—A process for recovering volatile solvents by means of a sponge saturated with olive oil or with a heavy mineral oil.—Illustration in Amer. Drug., 1893, 155.

Evaporation in Small Vessels—Acceleration of.—E. Whitfield.—Jour. Anal. and App. Chem., 5, 181.

Evaporation of Liquids at Low Temperatures.—S. v. Dzierzgowski and L. v. Rekowski.—Centralbl. f. Bacteriol., 1802, 685; Chem. Zeit. (Chem. Rep.), 279.

Evaporating under Reduced Pressure—Simple Apparatus for.—Schulze and Tollens describe an apparatus similar in principle to that recently recommended by Yaryan for use in the extraction of sugar on the large scale.—Ann. der Chem., 271, 46.

Extraction Apparatus for Fluids.—Holde describes the apparatus adapted for the determination of fat in fluid emulsions, which is particularly useful in milk analysis. The substance to be operated on is filled into the apparatus to the line *e e*. The ether condensed in the condensing tube *d* flows back through *c* to the floor or bottom of the apparatus, where it disseminates through the liquid being operated on, dissolves the fat, and gradually fills the chamber above *e* with the ethereal solution of fat until the siphon *a* is filled to the turn and begins to act, carrying the solution down into the flask below, whence the ether is distilled up through *b* to *d* and again makes the rounds.—Chem. Zeit., 1892, 275; Pharm. Centralh., 1893, 65.

FIG. 40.

Extraction Apparatus.

Condensation and Extraction Apparatus.—K. Farnsteiner in Chem. Zeit., 1892, 1030. Holde, Ibid., 275.

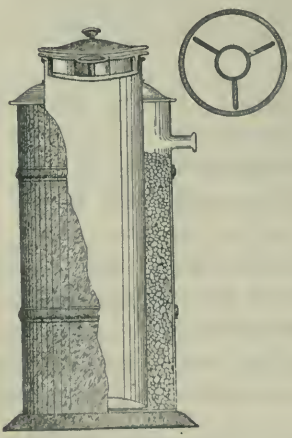
Fat Extraction—New Apparatus for.—Willard and Failger.—Jour. Anal. and App. Chem., 5, 436.

Hot Filtration.—T. Paul. The apparatus consists of a glass or metal flask fitted with an air condenser and three side tubes. One side tube is used for introducing and withdrawing liquids. Of the other two side tubes, one takes the vapor of the liquid in the flask to the spiral jacket of the filter-funnel; the other takes the condensed vapor back into the flask. A tube splayed out at the top is fused into the inside of the neck of the flask between the two last-mentioned side tubes, and reaches to the bottom of the flask. This tube is closed at the lower end, but about 1 mm. up has a number of holes arranged in rings.—Ber. d. Chem. Ges., xxv, 2208.

Filter Plaiter.—The implement consists of a disc of some durable material which can be laid together precisely like a folded filter. To use, all that is required is to place the sheet of filtering paper on the plaiting disc, and then to fold up the latter. On opening, the paper will, of course, be creased in the requisite manner.—West. Drug., 1892, 462.

Water Filter—A Bactericidal.—Chem. and Drug., 1893, 492. It consists of two parts—an inner within an outer cylinder, the interspace being

FIG. 41.



Water Filter.

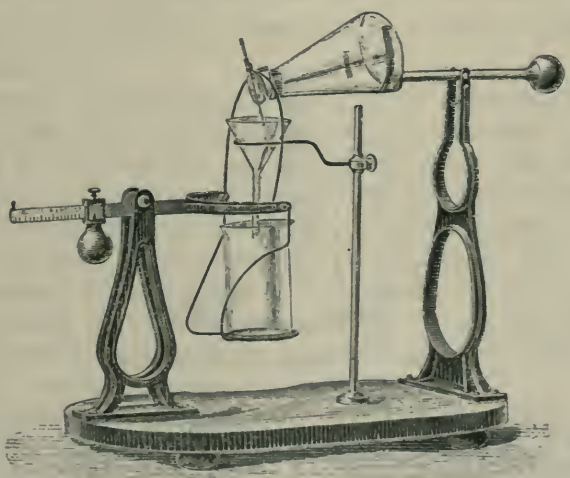
packed with small pieces of marble up to three-fourths of the total weight. Into the top of the inner cylinder is fitted a perforated tray, which is divided into 3 parts for the reception of tartaric acid in large crystals. It is only when the water is very bad, as in hot and cholera-stricken countries, that all three spaces are filled with the acid. Each space, we may say, holds about two drachms of acid. On filling the inner cylinder with water it is evident that the acid will be dissolved; then, as the water ascends the outer cylinder through the marble to the outlet tap, the acid is

gradually fixed by the calcium carbonate, so that when drawn off the water does not taste sensibly acid, and it is slightly charged with carbonic acid gas. Such is the method of working the filter. As to its effects on water containing cholera bacilli, we have before us a report by R. Fresenius which is of a highly satisfactory nature. At different times he has added to sterilized water a broth-culture of cholera bacilli, and this he passed through the filter. One cubic centimetre samples of the water put in, and of the filtrate, were tested by plate cultures, and the results are shown in the following table. The water was infected at 11.20 a. m.:

Time.	Infected Water.	Filtrate.
11.20 A. M.–11.40 A. M.	Innumerable cholera bacilli.	No cholera bacilli and very few other bacteria.
12 noon.	ditto.	ditto.
1 P. M.	ditto.	ditto.
2.30 P.M.	ditto.	ditto.
4 P. M.	ditto.	ditto.
5 P. M.	ditto.	ditto.
6 P. M.	ditto.	ditto.
7 P. M.	ditto.	ditto.
9 P. M.	Sterilized.	ditto.

Filtering Apparatus—Automatic.—The accompanying cut illustrates this

FIG. 42.



Automatic Filtering Apparatus.

apparatus invented by F. A. Hoffman. In practice the weight is moved out on the arm to the left until the beaker hangs close up to the funnel. The

lever on which the beaker hangs is there connected by a wire bow with the half-filled flask above, whence the liquid to be filtered flows. The weight is then pushed back on the arm until the liquid begins to flow, and is fastened there. The loss of the liquid makes the flask lighter and the counterpoise raises it, stopping the flow. The liquid passing through the filter into the beaker weighs it down, which pulls down the flask and empties more liquid into the filter, this operation repeating itself automatically until the entire liquid is filtered.—Pharm. Post, 1892, 1222, from Zeitschr. f. anal. Chem., 1892, 413. (From Amer. Drug.)

Filter Press.—H. Wilde combines with the filter press a cylindrical pressure vessel which can bear a pressure of several atmospheres.—Chem. Zeit., 15,445; Zeitschr. f. analyt. Chem., 1893, 81.

——— *Experimental.*—C. C. Hutchison describes the filter presses which he has designed; the metal used being aluminum bronze, and the plates are of celluloid.—Chem. and Drug., 1893, 334.

Filter for "Mayer" Estimations—F. C. J. Bird.—In this apparatus we have a conical flask fitted with a rubber cork, through which passes a tube shaped as shown, the bulb being filled with asbestos; the bellows of a spray-producer, is connected with a tube which passes into into the air-space of the flask. A funnel closed with a stopper inserted, the limb of the funnel being bent to an angle and bent diagonally as shown. The fourth tube is closed with a burette-clip. In working,

FIG. 43.

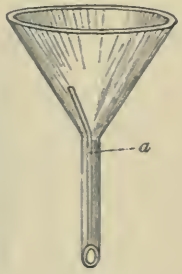
Filter for "Mayer" Estimations.

the "Mayer's" solution is run in through the funnel into the alkaloidal solution until precipation apparently ceases; then some of the mixture is squeezed out with the bellows through the tube, thus enabling the operator to judge, by testing the clear liquid driven into the beaker, whether the end point has been reached or not.—Chem. and Drug., 1892, 327.

Funnel—Non-Tipping.—Illustration in Chem. and Drug., 1892, 610.

——— *Glass—With Air Escape.*—Pharm. Centralh., 1893, 65. Fig. 44 shows a glass funnel, made in Germany, the operation of which is sufficiently clear from the illustration. By means of the air tube *a* the air from the receptacle to be filled is enabled to escape without sputtering or stopping up the mouth of the receptacle.

FIG. 44.



Glass Funnel.

Gas Generating Apparatus—A Continuous.—A. von Kalecsinsky. Zeitschr. f. anal. Chem., 1892, 544. Illustrated.

Gas Volumeter—A Suitable Form of.—G. Lunge.—Zeitschr. f. angew. Chem., 1891, 410.

——— *Improvements in.*—G. Lunge.—Ber. d. Chem. Ges., xxv, 3157.

Lunge's Gas Volumeter—New Accessory to.—J. A. Muller.—Abstract Jour. Chem. Soc., 1893, 229. (Illustrated.)

New Gas Volumeter.—Ibid., 230.

Gas-Volumetric Determination of Organic Acids and of Iodic Acids.—H. Kux.—Zeitschr. f. anal. Chem., 1893, 129.

Gas Absorption—Improved Pipette for.—A. H. Gill employs a simple gas pipette fitted with a rubber bag, after the manner of the pipettes in the Orsat gas apparatus as furnished by Muencke. This is found to preserve the reagents better, and to have the additional advantage of being much more easily filled and handled.—Amer. Chem. Jour., xiv, 231.

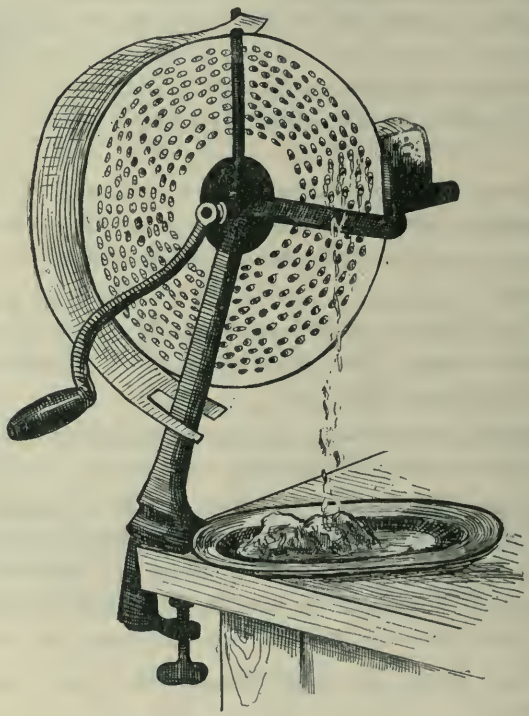
Gases—Wash Bottle for.—J. Habermann, in Pharm. Centralh., 1893, 65. (Illustrated.)

"*Distlehorst*" *Grating Apparatus.*—C. S. N. Hallberg.—West. Drug., 1893, 88. In the accompanying illustration is presented an apparatus consisting of a circular disk, or grater, made of steel and nickel-plated, which revolves by operating the handle. On one side is a small platform upon which the substance desired to be grated is placed and firmly pressed against the revolving wheel with the fingers. The apparatus is lightly fastened to a counter or a table-top by the set-screw, a shallow pan is placed under the wheel to receive the grated material, and the operation proceeded with by turning the wheel with one hand, while the material is pressed against the grater with the other.

The apparatus has many applications, such as grating lemons, oranges, soap, paraffin for "dancing-floor wax," and is also superior to chopping in preparing beef for "beef-tea," or extract, etc. The revolving plates being very substantially made may also be used for obtaining in a moderately coarse powder many drugs, such as roots of rhubarb and gentian, barks of wild cherry, etc. Since it is quickly placed in position, easily operated, and readily cleaned, it has decided advantages over contusion

in a mortar, when smaller quantities, an ounce or two, of friable drugs are desired for making extractive preparations. By unscrewing the handle the

FIG. 45.



"Distlehorst" Grating Apparatus.

revolving plate is detached, and is then easily cleaned by brushing it with water.

The Homeotrope.—An instrument invented by Gossard of Caen, France. Its principal purpose is the estimation of impurities contained in commercial alcohol, but it is equally available in the case of almost every other manufactured liquid, whatever its composition.—Description in Drug. Cir., 1892, 219; from Jour. de Pharm. d'Anvers.

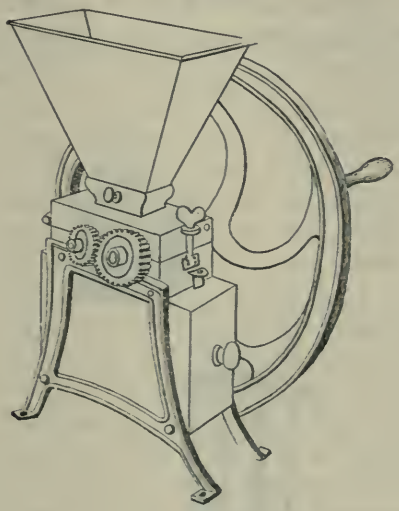
Measuring of Liquids—Apparatus for Rapid.—A. F. Reid in West. Drug., 1892, Sept.

Maceration and Enfleurage.—A description of these two methods for the extraction of perfumes.—Pharm. Record, 1892, 366.

Drug Mill—A New.—In Chem. and Drug., 1892, 808, we find a new mill described as follows: The grinding-surfaces are two solid steel cylinders the surfaces of which are turned into helicoid grooves, and in the act of grinding these rotate in opposite direction, thus inducing thorough disin-

tegration. There is a sliding toothed plate below the cylinders, which keeps the cylinders always clean. The mill can be quickly taken down into

FIG. 46.



Drug Mill.

parts for cleaning. The mill will grind anything from linseed to ipecacuanha.

New Nitrometer for Determiniug Nitrogen in the Salts of Ammonium. —W. Henschel.—Ber. d. Chem. Ges., 23, 2402.

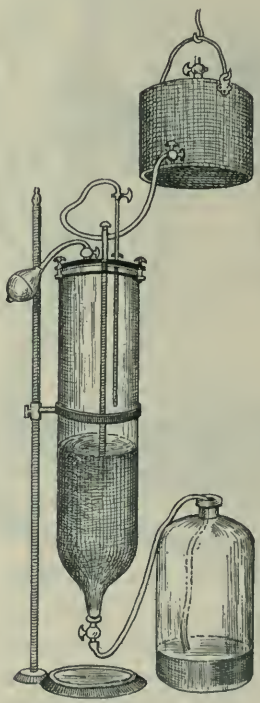
Percolator—The Peerless.—C. S. N. Hallberg, in West. Drug., 1893, 46.

The illustration shows the apparatus in operation, consisting of a well-made cylindrical glass percolator, firmly supported on a substantial stand in a rubber-fitted ring, the orifice being furnished with a stop-cock, upon which is attached the rubber tube for the exit of the percolate. The drug is packed upon a diaphragm resting in the neck of the percolator, and afterward covered with a disk of cloth or paper. Upon this the superior diaphragm is placed, and by means of the affixed rod pressed down firmly. After having fastened on the cover air-tight by means of the screw clamps, the central hollow piston is forced down over the rod of the diaphragm, provided with a spiral screw, and a safe degree of compression of the contents effected. The menstruum is poured into the reservoir, which is connected with a side tube through the cover for the inlet of the liquid above the drug column. By raising the reservoir to a height of 10 or 15 feet, the liquid rushing through the tube soon fills the space above the drug, which should be kept covered with it to a depth of several inches, until the drug column has been permeated, and after the required period of maceration.

In proceeding with the operation the proportion of menstruum suggests

its economizing to obtain its hydrostatic effect, by permitting only sufficient of the liquid to flow from the reservoir to cover the lower end of the outlet tube. This can be lowered or raised to suit. By now opening the valves to the reservoir, air may be forced into the percolator through the hand bulb, care being taken to open and close this valve before and

FIG. 47.



The Peerless Percolator.

after each operation. The air forces the liquid through the tube back into the reservoir, and the pressure may thus be maintained until the last portion of the menstruum has been used. After all the menstruum has been utilized, the reservoir may be filled with weak alcohol or water, and the original liquid almost entirely displaced.

Pipettes for Measuring Poisonous Liquids.—A. F. Reid (in Chem. News, 1892, 166), describes and illustrates two forms of pipettes, in one of which an india rubber ball perforated in the side is used, instead of the usual form of cotton wool moistened with antidote inserted in mouth of pipette.

Pipette—With Stop-Cock.—The stop-cock is opened as shown in Fig. 48, the pipette is filled with the liquid until the bulb is half

full, and the cock is then turned one-fourth, which shuts off the liquid in the pipette proper from that in the other tube. By another quarter turn the air enters through the tube *b* and the measured quantity then flows off.—Pharm. Centralh., 1892, 700.

Fig. 48.

Pipette.

——— *Simple Method of Calibrating a Pipette.*—F. Clowes, in Jour. Soc. Chem., Ind. The clean and dry pipette is first provided with an arrangement for closing the delivering end, so that it may be weighed while it contains water. This arrangement is effected by slipping a strip of rubber 4 inches long and ¼ inch wide over the lower end of the pipette, then drawing up the free ends on opposite sides under slight tension and binding them tightly with copper wire. The rubber now forms an elastic loop, with which the end of the pipette may be closed at pleasure. An india rubber ring, cut across, answers admirably for this strip. In the process of calibration the rubber loop is drawn aside and the pipette filled by suction. The pipette is allowed to empty and drain for half a minute, and, the end being immediately closed by the rubber band, is weighed at once. Distilled water at 15.5° C., is now introduced into the upper end of the pipette by means of a fine wash-bottle jet, until the graduation is reached. The pipette is now weighed again. The increase in weight should be equal to the weight of the registered number of ccm. at 15.5° C. Should this not be so, a little water may be added or taken away by means of a piece of glass tube drawn out into a slender capillary. Having adjusted the weight of water so as to correspond with the registered volume, the graduation is then made in the usual manner.—West. Drug., 1892, 261.

Fig. 49.

Pipette.

——— *for Quantitative Estimations.*—Le Roy, (in Chem. Centralb.; Pharm. Centralh., 1893, 65), describes a pipette (Fig. 49) which is of value, since it fills up to the zero point automatically, and its operation can thus be entrusted to the hands of unskilled workmen. An ordinary pipette is cut off at *b*, a delivery tube *c* expanded to pass over the shoulder, to which it is luted. This tube is provided with an opening on the side *e* and a rubber tube is drawn over the top and is provided with a pinch-cock. To fill the pipette, plunge the point of it into the liquid, suck the rubber tube, closing the hole *e* with the finger until the liquid rises through *b*. The contents thus measured will flow out on removing the finger from *e*.

Pill Machine—A Mechanical.—This machine is in two parts, one of which is an apparatus for making the mass, while the other divides the mass and forms it into pill form. By a special construction,

uniformity in the size of the pills is insured. The machine will turn out from 30 to 36 small pills at one time, or a proportionately smaller number of larger pills, its daily capacity being 150,000 pills.—Illustrated in Am. Drug. and Pharm. Record, 1893, 407.

Compression Machine—Kilian's.—For pastilles.—Pharm. Post, 1893, 69.

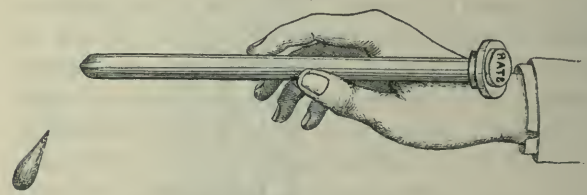
Powder Dividers.—Illustrations and description of three forms in Chem. and Drug., 1892, 155.

Automatic Sprengel Pump.—H. L. Wells.—Ber. d. Chem. Ges., 24, 1037

Saccharometer Scale.—Examination and correction of.—K. Ulsch. Zeit. f. Brauwesen; Chem. News, 1893, 174.

Sealing Wax Holder—It is a tube with a screw-top (upon which a seal

FIG. 50.



Sealing Wax Holder.

may be engraved), from which a spring presses down the stick or piece of wax which is inserted. The holder is not only useful in itself, and an elegant and handy thing to work with, but it enables wax to be used to the last grain.—Chem. and Drug., 1892, 201.

Solution Jar—Rapid.—Illustration in Chem. and Drug., 1893, 148.

Apparatus for Quickly Heating Solutions.—Wiesnegg in Chem. Zeit., xvi, 178.

Sterilizer—A Convenient.—A. Levy has transformed an ordinary farina boiler made of extra heavy tin with copper bottom, for this use.

A six-quart farina boiler composed of two parts, the outer to contain the water (about 3 inches in height), bringing it within one inch from the bottom of the inner container, which bottom has been removed and a well-tinned and perforated one replaced.

The lip on the outer container serves to add boiling water from time to time, after which it is packed with ordinary cotton. Through the centre of the cover of the boiler is an opening, which answers as a receiver for a thermometer whose scale is divided from 120° to 220° F. A layer of absorbent gauze covering the perforated bottom prevents boiling water from coming in direct contact with the substance to be sterilized and completes the apparatus. A tripod and frame containing an alcohol lamp with (4) four burners accompanies the sterilizer in the event, that a stove or gas or oil burner is objectionable. With eight ounces alcohol a temperature of from

210° to 212° F. for two hours can be obtained. The above illustration shows the apparatus ready for use.—Am. Micros. Jour., September, 1892.

FIG. 51

A Convenient Sterilizer.

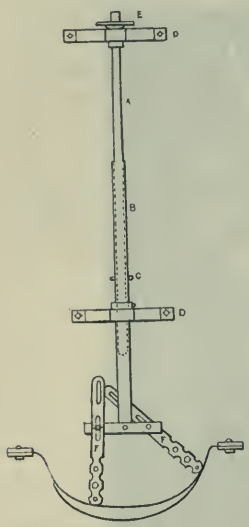
Pharmaceutical Stills.—F. Edel.—Pharm. Record, 1893, 212.

Syphon for Drawing off Hot Liquids.—J. C. Essner.—Bull. Soc. Chim. de Paris, vi, 19.

Mechanical Stirrer—A Description of a Simple.—For Open Steam Pans.—John Moss, in Pharm. Jour. Trans., 1893, 945. It consists mainly of a 1¼-inch shaft "*A*" and a hollow shaft "*B*" which slides easily over it. These can be geared together by a pin "*C*" fitting into a hole which passes through both shafts from side to side. The shafts are held vertically over the center of the pan by means of wall brackets "*D*." The upper end of "A" carries an 11-inch grooved pulley "E," round which passes the gut-band bringing the turning power; the boss of the pulley works directly on the brass journals of the upper wall bracket. A collar with set-screw below the journals prevents any upward movement of "*A*." On the lower end of "*B*" two blocks of hard-wood (birch) hollowed to receive the shaft are bolted to each other through it; at each end of

the double block is a bolt with sunken head, projecting two inches through; the projecting bolts carry the paddles "*F*," which are provided with slots to receive them, and quick turning winged nuts enable the paddles to be held at any angle from horizontal to vertical. It will be noticed in the plan that the paddles are fitted on opposite sides of the block. "*B*" is provided with a collar and set-screw, the collar being so fixed that "*B*" may fall to the precise point at which it is to work; this brings the holes in the two shafts into correspondence.

Fig. 52.



Mechanical Stirrer.

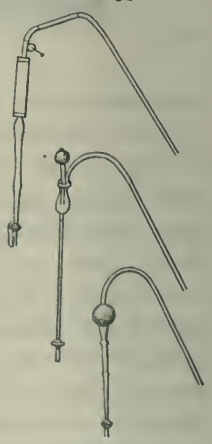
The paddles "F" are made of hard wood (ash by preference), and besides the slots previously mentioned, the blade, or part which works in the liquor, is perforated with holes of different sizes, not less than one inch in diameter; it is also scalloped round the edges. If the blade were entire, after a few revolutions the contents of the pan would move round as a solid mass, there being none of that breaking up into currents of different sizes, moving at different speeds, which is the very essence of successful stirring. The blades for a pan 36 inches across by 12 inches deep, measure 24 inches by 2½ inches by ⅝ inch, and are of course subject to variation both in size and shape.

Syphons and Seltzogenes—Gerant's Patent.—Illustrated in Chem. and Drug., 1892, 476.

Syphons.—R. Ebert describes two simple forms of syphons. Chem. Zeit., 1892, 1955.

——— *New.*—The upper figure represents a syphon which is very easily cleaned, as the tubes and the cylinder are jointed in such a way that they may be separated. To use this syphon it is only necessary to introduce the tube on the right into the liquid, to close the stop-cock, and to turn the crank, whereby the entire tube on the left and the cylinder descend, creating a partial vacuum, to fill which the liquid rises in the syphon. On opening the stopcock the liquid will flow.

Fig. 53.



Syphons.

In the syphon represented in the middle the cylinder is replaced by a rubber bulb, by which the air is exhausted. The enlarged portion is made of glass, so that the height of the liquid can be observed.

In the lower figure the cylinder is again replaced by a rubber bulb, but arranged in another way. The tube on the right is introduced

into the liquid, the rubber bulb is forced into the funnel and the stop-cock closed. The bulb is then allowed to expand and the liquid will rise in the syphon. Some of the advantages claimed by the author are: that sucking by the mouth is avoided; that the liquid can never flow back; that the flow can be regulated or shut off entirely at will; that these syphons may be used for any liquid without regard to its specific gravity. —Zeits. Oest. Apoth. Ver., 1893, 54.

——— *Improved Simple Form of.*—Hirsch, (Pharm. Centralh., 1893, 65,) suggests that the short end of the ordinary syphon be bent upward. The syphon is inverted and filled, the longer end stopped with a cork, the shorter end stopped with the finger. It is then turned over, the finger removed, the short end plunged in the liquid, and the cork removed from the other end.

Specific Gravity Apparatus.—H. B. Fulton.—Jour. Soc. Chem. Ind., xi, 305. For slags and ores.

Specific Gravity of Liquids for Practical Purposes—Determination of the. —Wright discusses, in detail, the appliances ordinarily used for determining the sp. gr. of a given liquid. In cases in which a high degree of accuracy is requisite, he has found certain modifications of the existing instruments of considerable practical use. He describes a modified form of pyknometer which he has found very serviceable, not only in obtaining values exact to five places of figures if requisite, but also in obtaining a series of valuations at different temperatures with comparatively little trouble. Various useful tables for correction are also given.—Jour. Soc. Chem., Ind., xi, 297.

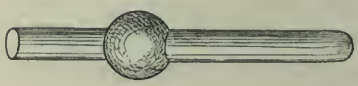
——— *of Powdered Substances.*—This may be found (W. J. Smeeth, The Analyst) by warming petrolatum in a watch-glass to expel the air, cooling, and weighing in water. Then after removing from the water, again warm, and sprinkle the powdered substance on the petrolatum, and again weigh in the water. The difference will give the loss of weight in water; the weight in air divided by this figure gives the specific gravity. West. Drug., 1892, 329.

Spatulas.—At a pharmaceutical meeting in Philadelphia, C. B. Lowe exhibited a spatula of steel covered with hard rubber. A doubt was expressed as to whether the expansion of the two substances was not so different as to cause the rubber to break away from the steel. It was stated that great care should be taken for fear of such a flaw occurring, and thus introducing a poisonous substance into some other mixture intended for quite a different purpose, as happened recently when veratrine, which was retained by a crevice in a mortar, was introduced into a mixture, although the mortar had been carefully washed with alcohol, and afterwards with a cloth and hot water. The proper method is never to use a mortar for such articles, and for remedies intended for internal use. The discussion brought out the bettter method of preparing veratrine ointment by mixing the alkaloid with either a small quantity of oil or glycerin.—Am. Jour. Pharm., 1893, 203.

Suction and Pressure Apparatus—Continuous Action.—W. Reatz.—Zeitschr. f. anal. Chem., 1892, 669.

Test Tube—A New Form.—The bulb is an effective means of preventing boiling over in many chemical operations, and when the lower part of

FIG. 54.



Test Tube.

the tube is only partly filled, the tube can be placed on a bench without spilling the contents. In use we expect that the tube will develop other advantages according to the notions of each operator, but meanwhile it is likely to be a tube which medical men will take to. The leading sundries houses stock the tubes.—Chem. and Drug., 1893, 286.

Thermometers — Apparatus for Testing Medical.—Pharm. Centralh., 1892, 725.

Thermometer Testing by the Pharmacist.—A. Levy.—Pharm. Era, 1893, 485.

Thermometric Systems.—A correspondent of "La Nature," writes concerning the adoption of the centigrade thermometer as the legal standard of heat measurement in Prussia.—Nat. Drug., 1893, 29.

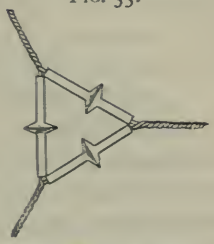
Thermometers—New High Temperature.—The Imperial Physical Institute at Charlottenberg has perfected a mercurial thermometer by which temperatures up to 550° C. (1,022° F.) can be accurately measured. The bulb and stem are made of a highly resistive glass, manufactured especially for the purpose, and the space above the mercury is filled with liquid carbonic acid. The pressure produced by this prevents the mercury from boiling or vaporizing, even at the very high temperature named.—Nat. Drug., 1893, 185, from Zeitschr. f. Instrum.

Titration Apparatus with Automatic Zero Adjustment.—Krawczynski. —Into one neck of a two-necked Wolff's bottle of suitable capacity is fixed by means of a cork, a burette consisting of an inner and outer tube; and to the other neck of the bottle is fastened a small two-bladder hand bellows, and a side tube for releasing the air pressure after the burette is filled. The inner tube of the burette is open at both ends, reaches nearly to the bottom of the Wolff's bottle, and ends about 5 c. m. below the top of the outer tube, this point being the zero mark. The outer tube, fused in the inner tube just above the cork, is graduated, and has an ordinary burette tap fused into the side near the bottom.—Ber. d. Chem. Ges., xxv, 3010.

Triangle—Improved.—J. B. Coleman describes an improved form of

the clay triangle in Chem. Centralb., 1892, ii., 18; Pharm. Centralh., 1892, 700. The projection on the side allows the crucible to receive the flame on nearly its entire surface, thus effecting, it is calculated, an economy of twenty-five per cent. in the gas and time consumed as compared with the old style.

Fig. 55.



Improved Triangle.

Ureometer of Auguy.—Nouv. Rem., 1892, 557; Rep. de Pharm., 1893, 38; Pharm. Centralh., 1893, 253.

Wash-Bottle—Gravity Pressure for.—Illustration in Amer. Drug. and Pharm. Record, 1893, 341; from Jour. Anal. App. Chem.

Water-Baths of Porcelain.—Fischer and Dittmar. Chem. Zeit., 1892, 15, 1467. These are preferable to copper on account of their cleanliness and cheapness.

Water Marks—Detection of Imitations of.—A writer in Chem. Zeit. points out that "artificial" water-marks are sometimes produced on paper by pressure, the "natural" ones being formed, as is well known, in the process of manufacture. The two kinds may be distinguished, he says, by immersing the paper in a strong solution of caustic soda (30 parts of caustic soda and 100 parts of water). The "natural" water-mark becomes more noticeable by this treatment, while the "artificial" water-mark vanishes. The cause of this difference of behavior is that the "natural" water-mark consists of a portion of the paper which is actually thinner than the surrounding parts, whereas in the case of the "artificial" water-mark the thickness of the paper was originally the same at that spot as at any other, and the action of the caustic soda swells the compressed fiber to its former dimensions—Drug. Circ., 1892, 275.

PRESCRIPTION DIFFICULTIES.

Explosive Substances.—W. C. Knight. A compilation of substances which explode when triturated singly or when mixed with other substances.—Pharm. Era, 1893, 103.

Explosive Prescription.—

Iodol	0.5 gramme.
Yellow oxide of mercury	0.2 gramme.
Petrolatum	10 grammes.

On rubbing the iodol and oxide of mercury in a mortar in order to produce an intimate mixture, a loud explosion followed, which would probably have had serious results if the quantities used had been larger. This would have been prevented if the compounder had previously added some

liquid petrolatum to the iodol and yellow oxide of mercury.—Rép. de Pharm., 1893, 105.

Iodine ..... 10 grammes.
Alcohol ..... 30 grammes.
Oil of turpentine ..... 200 grammes.
For inhalation.

The alcohol was insufficient to dissolve the iodine entirely, so the mixture of iodine and spirit well triturated was mixed with the turpentine little by little and a fairly good preparation turned out. A small quantity of iodine rubbed in a mortar and then mixed with the turpentine, soon heated and ignited the latter, showing what would have happened if the method of mixing had been inverted.—Chem. and Drug., 1893, 721.

——— The following preparation after standing for 24 hours produced a violent explosion. Spirit of nitrous ether, fluid extract of belladonna, tincture of aconite, tincture of gentian, nitrate of potassium, chloride of ammonium and water. The explosion was attributed to the presence of potassium nitrate with ammonium chloride and spirits of nitre. The nitrates always explode when mixed with organic matter, when subjected to even a moderate heat. It is probable that the bottle was near the fire and the ammonium chloride in the presence of free chlorine formed nitrogen chloride, which is excessively explosive, and more so when in contact with essential oils, fixed oils, and fatty bodies, etc. Finally the spirit of nitre sometimes explodes when it is mixed with fluid extracts.—Boll. Chem. Farm., 1893, 173; Amer. Drug. and Pharm. Record, 1893, 199.

An Explosive Mixture.—Chem. and Drug., 1892, 413.

Sodii biborat ..... ℥iv.
Chloralis ..... ℥ii.
Atropinæ ..... gr. iv.
Spt. vini rect ..... f℥i.
Aq. sambuci, ad ..... f℥xii.
Ft. lotio.

Explanation. Chloroform had been formed by the action of borax on the chloral, and the strong heat caused this to burst the bottle.

Strychnine Poisoning—An Incompatible Mixture.—J. R. Hill. Case reported by Dr. Tweedale Thomson, in Brit. Med. Jour., 1893 406.

℞ Tinct. strophanthi ..... ℥i.
Liq. strych. hydrochlor ..... ℥iiss.
Sol. bismuth. et pepsin. (Richardson's.) ..... ℥iss.
Sp. ammon. aromat.,
Sp. chloroformi ..... āā ℥iss.
Aquæ, ad ..... ℥vi.
M. Ft. mist. "Shake the bottle."

Sig.—Two teaspoonfuls when the attack threatens, and repeat in an hour if necessary.

The patient took the last dose from the bottle, and thought it unusually bitter. She showed all the symptoms of strychnine poisoning, but recovered. The atmospheric temperature was excessively low at the time, and Dr. Tweedale Thomson throws out the suggestion that this may have caused some of the strychnine to crystallize out. He also hints that the patient had not duly appreciated the "shake the bottle" instructions.

What really happens is this. There is not sufficient alcohol present to retain the whole of the chloroform in solution, and a portion separates out in the form of small globules, which aggregate at the bottom of the bottle and do not readily shake up again. This precipitated chloroform carries with it the greater part of the strychnine.

The makers of Richardson's liquor bismuth. et pepsin. state on the label that each fluid drachm contains:—

Bismuth oxide	grs. iii.
Strychnine	gr. $\frac{1}{30}$.
Prussic acid.	♏ ii.
Pepsin	gr. i.
Chloric ether, etc.	

J. R. Hill found on analysis that it is practically liquor bismuthi et ammonii citratis B. P., with the above ingredients in addition, and colored apparently with cochineal or carmine. Each fluid ounce contains 1½ minims of pure chloroform. The sample examined was distinctly alkaline, and indicated 0.17 per cent. of free ammonia. Dr. Tweedale Thomson's mixture, containing also aromatic spirit of ammonia, is therefore decidedly alkaline, and contains 1.7 grains strychnine and 38.25 minims of chloroform.—Phar. Jour. Trans., 1893, 799.

Incompatible Mixtures.—Hugh Kerr (in Chem. and Drug. and Pharm. Jour. Trans., 1892, 456) considers the following:

Hydrarg. subchlor	gr. j.
Sodii iodidi	ʒij.
Tinct. cinchonæ	℥ iiss.
Aquæ ad	℥ vj.

M.

The author found that the following method gave a perfectly bright and satisfactory mixture: Dissolve the sodium iodide and mercuric chloride in two fluid drachms of water, add the tincture of cinchona and sufficient water to make three fl. oz. Mark the dose one-half of that in the prescription.

Tinct. guaiaci ammon	ʒij.
Mucilag. acaciæ	ʒij.
Quin. sulph	gr. viij.
Acid. sulph. dil	ʒiv.
Potass. bicarb	ʒj.
Aquæ ad	℥ iv.

This may be taken as an utterly hopeless instance of incompatibility, and, however manipulated, nothing but a nasty-looking mess can be obtained:

Liq. strychninæ hydrochlor	♏c.
" arsenicalis	♏lxx.
" potassæ	℥ij.
Aquæ ad	ℨ iij.

This looks almost hopeless. Ultimately it was found that if dispensed according to the following formula, the strychnine is retained in solution:

Liq. strychninæ hydrochlor	♏c.
" arsenicalis	♏lxx.
" potassæ	℥ij.
Spirit. vini rect	ℨ ij.
Aquæ ad	ℨ iij.

As the dose is one teaspoonful, there is no objection to this modification. The separation of crystals when proof spirit was used raises a doubt as to the correctness of the statement that strychnine is soluble in 400 parts of that menstruum. On referring to published authorities as to the solubility of the alkaloid, the following discrepant statements were found: In water: Squire, 1 in 5,760; Martindale, about 1 in 6,000; U. S. Dispensatory, 1 in 6,700. In rectified spirit: Sp. gr. 0.838, Squire, 1 in 140; sp. gr. 0.920, Squire and Martindale, 1 in 400; sp. gr. 0.820; U. S. Dispensatory, 1 in 110. It is evident that there is here a subject for further investigation.

Incompatibility.—

Solution of dialyzed iron	25 gr.
Fowler's solution	4 gr.
M. Drop by drop.	

After this procedure he noticed the formation of a dense precipitate upon the walls of the flask. The gelatinous product is the hydrated oxide of iron, produced from the alkali carbonate in Liq. potassii arsenitis. He suggests the use of an arsenical salt solution free from alkalies.—Bull. Chem. Pharm., 1893,146.; Amer. Drug. and Pharm. Record, 1893, 199.

——— C. Eloy, in Rev. Gen. de Clin.; Bull. Pharm., 1892, 611. Benzoate of sodium and perchloride of iron form an inert precipitate which has an extremely disagreeable taste. Quinine and caffeine make a bad mixture when benzoate of sodium is employed to dissolve the caffeine; the best solvent for both is tartaric acid. Morphine and strychnine act badly with the iodides. Borax and cocaine, often prescribed by ophthalmologists, are incompatible, as are also alum and honey of rose; for the latter, syrup of mulberry is recommended.

——— Xanthopolous has observed that if strontium bromide be (Rev. Medico-Pharm.) mixed with sodium bicarb. lively effervescence results, and a white precipitate of strontium carbonate is formed. The resulting mixture is one of strontium carbonate and sodium bromide.—West. Drug., 1893, 148.

Strychnine Salts and the Haloids.—According to Allen the solubilities of the hydrochloride, hydrobromide and hydriodide of strychnine are as follows:

Hydrochloride	1 part in 50 parts of water.
Hydrobromide	1 " 32 " "
Hydriodide	sparingly.

The statements relative to the solubility of strychnine sulphate vary from one part of the salt in nine parts of water to one part of salt in fifty parts of water.

The following prescriptions have been pronounced incompatible:

Strychnine sulphate	1 grain.
Potassium bromide	7 drachms.
Water, enough to make	8 fluid ounces.

F. Sol.

The strychnine being dissolved in a portion of the water and the bromide in the remainder, and the two solutions being mixed, a clear solution results, from which, however, crystals gradually separate on standing over two days. But if one fluid ounce of alcohol is used in place of one of the eight fluid ounces of water, the solution is permanent.

Potassium bromide	8 drachms.
Elixir of strychnine valerianate	4 fluid ounces.

M.

No separation takes place from this mixture, nor from the following:

Strychnine sulphate	1 grain.
Compound tincture of cinchona	4 fluid ounces.
Potassium bromide	4 drachms.
Water	4 fluid ounces.
Syrup	1 fluid ounce.

M.

In the last prescription the compound tincture of cinchona furnishes more than enough alcohol to hold the strychnine permanently in solution.

But strychnine salts should not be dispensed in solutions with inorganic salts, unless at least twelve per cent. of alcohol is also contained in the mixture.—Olberg, in Apothecary, Dec., 1892.

Potassium Iodide with Citrate of Iron and Quinine in Mixtures.—Oldberg reaches the conclusion that one part of citrate of iron and qui-

nine dissolved in water, or in water and syrup, together with an equal or greater amount of potassium iodide, will afford a satisfactory mixture if the quantity of water, or water and syrup together, amounts to not less than 30 parts; and that the use of alcohol in place of any portion of the water does not improve the mixture, but, instead, causes considerable turbidity and discoloration if used in a proportion exceeding twenty per cent.—Apothecary, Dec., 1892.

Iodine Solution—A Difficulty.—Caspari, in Pharm. Rev., comments on the best method of preparing the following prescription as a clear solution:

Iodi	℥j.
Spir. camphoræ	℥iv.
Aq. ammoniæ	℥iv.
Acidi carbolici	gr. xxx.

Misce et signa: For inhalation.

This is a difficult mixture to compound, but the author has brought out the points that: 1. The iodine must be in perfect solution before adding the water of ammonia; 2. That the spirit of camphor must contain no water; 3. That the carbolic acid must be added to the full strength spirit of camphor before all the iodine will enter into solution. Either one of the two following methods will always insure a perfect solution with but a trace of blue coloration and no subsequent coloration: 1. Triturate the iodine with the carbolic acid and spirit of camphor (free from water) till a perfect solution is attained, then add the water of ammonia very slowly. 2. Mix the carbolic acid with the spirit of camphor (free from water) and dissolve in this the iodine by trituration, then add the water of ammonia very slowly. The theory is that camphor and carbolic acid, forming the well-known liquid phenol-camphor, add to the solvent power of the alcohol. The ammonia is liable to develop a blue color and precipitate, probably an aniline. The solution, when completed, is colorless, and has the odor of carbolate of iodine. It probably contains ammonium iodide, carbolate of iodine, excess of ammonia, and camphor.

Calomel and Hydrocyanic Acid.—Cheynet, (in L'Union Pharm.; Merck's Mark. Rep.) states that in dilute solutions hydrocyanic acid displaces hydrochloric acid, while in concentrated solutions the reverse is true. He, furthermore, announces that in mixtures containing calomel and hydrocyanic acid, the latter displaces the hydrochloric acid, that the bichloride formed gradually passes into a cyanide, and that the formation of this bichloride can only be considered an initial step in the reaction.

——— Some time ago it was reported in a British medical society that these two substances should not be prescribed together, on account of the hydrocyanic acid transforming the calomel into corrosive sublimate. More recent investigations have shown that there is no danger of such a result.—Bull. Pharm., 1893, 155.

Prescription Difficulty.—The following mixture at first looked slightly tinted and afterwards turned quite dark:

Sodii salicylas	℥iij.
Spts. aeth. nitrosi	f℥vj.
Aq. menth pip. ad	f℥vj.

Reason. Spts. aeth. nitrosi contained free nitrous acid, which formed a dark nitro-compound with sodium salicylate.—Bull. Pharm., 1893, 72.

ACETA.

Acetum Scillæ.—Helfenberger Annalen, 1891; Phar. Centralh., 1892, 424.

AQUÆ.

Distilled Water—Importance of the Use of in Dispensing.—G. Roe mentions the following:

Piperazine	gr. ij.
Phenocoll hyd.	gr. iv.
Aquæ ad.	1 fl. oz.

The above makes a clear mixture with distilled water, but when ordinary water is used acicular erystals are deposited.—Phar. Jour. Trans., 1882, 476.

Water—Commercial Distilled.—E. J. Parry gives results of his analyses of seven samples of distilled water from well-known London houses. The results, together with those of the water from which many of them are distilled, are tabulated below. The process used for determining the oxygen absorbed was Forschammer's, by which the water was allowed to remain in contact with acid solution of potassium permanganate for four hours in closed vessels at 80° F. The so-called "organic ammonia" was determined by Wanklyn's process. No calcium salts and no sulphuric nor nitrous acid could be detected in any of the samples. All figures are expressed in grains per gallon.

No.	Free NH_3.	"Organic" NH_3.	Oxygen Absorbed.	Residue on Evaporation.	Chlorine.
1	.0020	.0005	.003	Heavy traces.	
2	.0210	.0031	.052	Traces.	
3	.0083	.0015	.007	Heavy traces.	Traces.
4	.0135	.0013	.000		
5	.0043	.0007	.010		
6	.0927	.0035	.025	Heavy traces.	
7	.0168	.0023	.004		
New River water. (1)	.0006	.0026	.037	24.0	1.30
New River water. (2)	.0010	.0032	.029	21.0	1.23
New River water. (3)	.0004	.0044	.040	21.7	1.23

No. 3 contained .16 gr. and No. 6 .042 gr. of copper per gallon. No. 1 contained heavy traces of zinc and iron; No. 2 .014 gr. of iron per gallon, and No. 6 traces.

—Chem. and Drug., 1893, 184.

Distilled Waters—Coloring Matters in.—L. Viron has observed (*Compt. rend.*, cxiv, 179) the formation of coloring matters in distilled medicinal waters, and isolated from green orange flower water three pigments, viz.: one soluble in water with violet color, turning brown on exposure, secreted by a variety of *Micrococcus cyaneus;* one dissolving in alcohol with yellow color, secreted by *Bacillus aurantii;* and the third insoluble in alcohols, but dissolving in water with a green color. In some waters an organism was found producing a yellowish green fluorescence.—Am. Jour. Pharm., 1892, 470.

——— *Preservation of Medicinal.*—M. E. Crouzel (Bull. de la Soc. de Bordeaux, January, 1893, p. 17) considers the principal causes of alteration, the use of non-sterilized containers, exposure to air, contact with organic material, and principally filtering through paper. To avoid this latter cause he proposes, if filtering paper is to be used, to first pass a large quantity of simple distilled water through it, and then to submit it to a temperature sufficiently high to sterilize it. He uses glass for filtering, which, besides retaining the suspended impurities as well as the paper, has the additional advantage of serving indefinitely. He suggests further that the containers should be of such a dimension as to insure rapid emptying. —Am. Jour. Pharm., 1893, 174.

Volatile Oils in Aromatic Waters—Estimation of.—F. Ranwez (in Bull. Acad. roy. de méd. Belg., Brus., 1892, 4 s, vi, 757–765) recommends the following process: In 200 cm. of the aromatic water dissolve 60 Gm. of table salt; add 40 cm. of rectified ether; agitate well and decant the ether; repeat this treatment with 40 cm. and then with 20 cm. of ether. Mix the ethereal solution and then pour on calcium chloride, and filter the desiccated ether, to which the washings of the calcium chloride have been added, into an Erlenmayer flask, containing five cm. olive oil, and previously weighed after having been dried at 100° C. Then distil the ether carefully, avoiding ebullition. When the ether has nearly all distilled over, place in a drying-oven at a temperature of 35° to 40°, and aid the evaporation by drawing a current of air through the flask for five minutes.

When the odor of the volatile oil has entirely displaced that of the ether in the residue, make several weighings, placing the flask into the drying oven for three or four minutes before each weighing, and displacing the vapors by drawing in air, until the weighings remain constant; subtract this weight from the weight of the flask containing the olive oil previously taken, and the remainder is the weight of volatile oil; it is only necessary to multiply by five to have the proportion of the oil per litre of aromatic water.

The following table shows the author's results working by this process:

Plants employed for the distillation.	Belgian Pharmacopœia.			French Codex.		
	Gm. per litre.	Volatile oil contained in the litre.	Average.	Gm. per litre.	Volatile oil contained in the litre.	Average.
Ceylon Cinnamon .	100	1.308; 1.381; 1.327	1.338	250	1.725; 1.724; 1.740	1.729
Anthemis	200	0.428; 0.438	0.433	250	0.513; 0.520	0.536
Rose	400	0.1843; 0.1837; 0.1886	0.1885	1,000	0.480; 0.473; 0.418	0.457
Cherry laurel.....	....	1.325; 1.345; 1.290	1.32			
Valerian	100	0.135; 0.180; 0.162	0.159	250	0.208; 0.244; 0.172	0.208
Elder	300	0.153; 0.165	0.159	250	0.181; 0.197; 0.204	0.194
Spium graveolens..	100	0.255; c.260	0.257			
Orange Flowers ...	350	0.426; 0.432	0.429	500	0.462; 0.487	0.474
Quadruple Orange Flower Water...	....	.....	.....	1,000	0.5605; 0.5975	0.579

Bitter Almond Water—Preservation of.—The Germ. Pharm. directs that bitter almond water should be protected from the light. It has been shown, however, that the decomposition is not due to light, for diluted hydrocyanic acid kept in the dark showed signs of decomposition after some time, while the addition of a trace of mineral acid improved its keeping qualities. In the same manner bitter almond water will remain clear if two drops of hydrochloric acid be added to one Kg. of water.—Chem. Zeit., 1892, No. 33, from Pharm. Zeit., 1892, p. 780.

Aqua Laurocerasi and Aqua Amygdalæ Amaræ.—Estimation of Hydrocyanic Acid in.—Carl Weis.—Zeits. Oest. Apoth. Ver., 1893, 45, 344, 387.

——— Remarks upon the work of Weis by G. Schacherl.—Ibid., 391.

Cherry Laurel Water—Quantitative Estimation of HCN.—G. Gregor compares the different methods and gives a modification of the Austrian Pharmacopoeia III.—Zeits. Oest. Apoth. Ver., 1892, 472.

——— A continuation of this work. Ibid., 1893, 231, 256, 279.

Mint Water—Colored Vegetation in Distilled.—H. Barnouvin noticed in a distilled mint water (Rep. de Pharm., July, 1892,) an organic sediment which increased very rapidly. It consisted of groups of globular cells, having an orange-yellow color, destitute of mobility, and secreting a soluble pigment, imparting a yellow color to the water. The cells belonged to Micrococcus aurantiacus, Cohn.

Orange Flower Water—Impurities in.—R. G. Eccles finds lead in this preparation, which is said to be produced from the solder of the cans in which the water is shipped.—Drug. Circ., 1892, 219.

Tar Water.—Ernest Gille states that the concentrated tar solution of the Belgian Pharmacopœia (Norwegian tar, 250; sodium bicarbonate, 15;

water 1,000; heat in a water-bath for 3 hours and condense volatile products) has the specific gravity of 1.0127, leaves, upon the evaporation and drying of the residue, 3.7052 per cent. of extract, and yields 0.8932 per cent. ash. The tar water (made from conc. tar solution 30, and distilled water 970) differs but little from pure water in density, has but a slight tint, keeps unaltered for a long time, and yields 0.0918 per cent. of extract and 0.0253 per cent. of ash. The tar water of the German Pharmacopœia is considerably darker, becomes rapidly cloudy, has the specific gravity 1.0027, and yields 0.4966 per cent. extract and 0.0308 per cent. ash. Jeannel's formula, triturating intimately 10 Gm. tar with 10 Gm. sodium carbonate and diluting to obtain 1 kgm., gives a tar water whose specific weight is 1.0042, and which yields 1.2085 per cent. extract and 0.3640 per cent. ash.

Tar water prepared according to the Belgian Pharmacopœia, if subjected to distillation in a current of steam, yields a liquid which slightly reddens litmus, turns brown by action of alkalies, shows strong reducing power, is colored violet by ferric chloride, and yields iodoform with iodine and potassium. It gives the reactions of furfurol with aniline and hydrochloric acid. The concentrated liquor of the Belgian Pharmacopœia shows the same characters under the same conditions, but, of course, in greater degree. That in the German Pharmacopœia, upon distillation, yields a liquid which precipitates abundantly upon addition of an excess of bromine water.—Jour. de Pharm. d'Anvers., 1893, 81.

Distilled Tar-water is stated by Cornéille St. Marc. (*Poit. Médical*, 1892, No. 3), to rapidly arrest various forms of hæmoptysis and metrorrhagia, and to be useful in mucous metritis; but its action is uncertain in uterine carcinoma and fibro-myoma.—Am. Jour. Pharm., 1892, 365.

Water.—Analysis, Examination, etc.—See Water.

ASSAY.

Alkaloidal Assaying.—C. C. Keller. The Swiss Pharmacopœia, now undergoing revision, will show a marked progress in the matter of assayed drugs and preparations, since it is the intention to give for numerous preparations accurate or at least approximate quantitative methods of examination. Of the several general assay methods, (I) Dieterich's method (mixing the drug with calcium hydrate, drying, powdering, extracting with ether, evaporating, dissolving the residue in alcohol and titrating with $\frac{1}{100}$ *n*-hydrochloric acid, using logwood as the indicator) is opposed for several reasons: (1) The use of a fragile extracting apparatus; (2) the difficulty in obtaining complete extraction; (3) a number of the alkaloids are easily decomposed by the calcium hydrate, especially brucine, hyoscyamine, atropine, etc.; (4) The very great difficulty in preventing the ether from carrying particles of the calcium hydrate into the ethereal solution; some of these difficulties cause a loss of alkaloids, the last-

mentioned an increase in the yield of alkaloid. A. Partheil's modification of this method is rather a complication of the method without correcting any of its fallacies. (II) Beckurts and Holst's method (a modification of Dragendorff's method in which the objectionable emulsifying is prevented by extracting dilute alcoholic extract solution with three portions of chloroform of 20, 10 and 10 C.c. respectively, distilling off the chloroform from the mixed chloroform solutions, dissolving the residue in warm $\frac{1}{10}$ N-hydrochloric acid, filtering, washing the filter with water and titrating the solution with $\frac{1}{100}$ N-alkali, using cochineal as indicator) which generally gives agreeing results, possesses also some disadvantages: (1) Although the addition of alcohol at first prevents the emulsifying, the solubility of alcohol in chloroform and hence its removal causes, especially in the third extraction, considerable trouble in separating the chloroform; (2) owing to the presence of the alcohol, the alkaloid obtained is rather impure and colored; (3) numerous experiments show that the three portions of chloroform will not completely remove the alkaloid; to effect this the liquid must be extracted with chloroform until no precipitation occurs upon acidifying and adding Mayer's reagent; (4) it requires too much time. (III) Schweissinger and Sarnow's method (Proc.) (in which a concentrated aqueous solution of the extract made alkaline with ammonia is agitated with a relatively large quantity of a mixture of chloroform and ether, and then a portion only of the alkaloidal solution evaporated and weighed or titrated with $\frac{1}{100}$ N-acid, using cochineal as an indicator; the solvent can be a mixture of chloroform and ether, which may be lighter or heavier than water as may seem desirable) after numerous series of experiments is hailed as the method containing the basis upon which future Pharmacopœias will form their alkaloidal assays. As advantages are stated: (1) That no special apparatus is required; (2) by the use of the mixed solvent no emulsion is formed; (3) the rapidity of its execution; (4) with proper modification it is suitable not only for preparations, but also for crude drugs; (5) the comparative purity of the alkaloids; and (6) closely agreeing results.

In referring to its general use the following statements are interesting: In assaying extracts the *quantity should not be too small;* of fluid extracts the use of 6 to 10 grams overcomes the difficulty of weighing or titrating minute quantities of alkaloid, and has the advantage of allowing the use of $\frac{1}{10}$ or $\frac{1}{20}$ N-acid in titrating, whereby the process is made easier. The extract must not be too concentrated, or fallacious and varying results will be obtained, whereas proper dilution insures at once correct and agreeing results. For extraction the lighter chloroform-ether mixture is preferable because allowing the use of ordinary dispensing vials, and not necessitating the use of a separating funnel; mixtures containing little chloroform, in some cases even pure ether, are recommended because of the greater purity of the alkaloid; chloroform or mixtures containing a larger quantity

of chloroform tend to extract an impurer alkaloid. The extract solution should be agitated with the alkaloidal solvent before the addition of the alkali (almost exclusively water of ammonia), as this procedure favors the solution of the alkaloid when liberated. In the majority of assays the ether-chloroform solution can be poured off clear, in exceptional cases the solvent must be passed through a dry filter, preventing loss by evaporation by covering the funnel. By placing the alkaloid solution in a weighed Erlenmeyer flask, the solvent can be distilled off and the residue weighed and then titrated; this combination of weighing the residue and titrating it will serve to a certain extent as a check, and detect the addition of cheaper alkaloids to inferior preparations of the more expensive drugs; as an illustration is cited the addition of cinchonine to raise the alkaloidal value of an inferior fluid extract of ipecac. Attention is called to the fact that the weight of the residue always indicates a higher result than by titration; recently Prof. Norton and H. T. Nichols have proven that even by using pure alkaloids in chloroform solution an increase in weight results, and state that "the increase in weight is of importance, has as yet not been explained, and that to determine the cause further investigations will be made." The explanation is very simple: The alkaloid retains some chloroform which a temperature of 90° or even 100° C. will not, or only very slowly, dissipate; this behaviour is due to the high specific gravity of the chloroform allowing a film or layer of amorphous alkaloid to form on the surface, which then prevents the escape of the remainder of the chloroform; the last portions of the chloroform can be gotten rid of by dissolving the residue in 5 or 10 C.c. ether, and evaporating the ether at the temperature of the water-bath; by repeating the operation only traces of the chloroform will remain, and drying at 90–100° C. is facilitated by the amorphous alkaloid becoming crystalline. The titration of the alkaloidal residue is effected readily by dissolving in alcohol, adding water until a faint turbidity results, and titrating with the acid; hæmatoxylin (1 per cent.) in alcoholic solution gives after a little practice the best results as an indicator, care being taken to add only one or two drops of the solution, otherwise difficulty is encountered in determining the end reaction.—Amer. Jour. Pharm.; from Schweiz. Wochenschr. f. Chem. u. Pharm., 1892, 501 and 509.

——— Caspari (in Pharm. Rev., 1892, 211) says: "It can be safely assumed that the operator will choose for isolation of the alkaloids the method likely to yield least contamination with coloring and other foreign matter; the crude residue thus obtained may be weighed, and should then be dissolved in an excess of decinormal hydrochloric acid with the aid of gentle heat, noting the number of cubic centimeters of acid used, and making the solution up to 50 or 100 C.c. A sufficient quantity of indicator (Brazil-wood decoction) is now added to show the pale yellow color produced by the acid, and centi-normal alkali then carefully added

from a burette, until the pale pink color (permanent) shows that a trace of alkali has been added in excess. The correct reading of the burette is now made, and from the amount of acid in combination with the alkaloid is calculated as follows: Our hydrochloric acid being $\frac{N}{10}$, we must multiply the number of C.c. used by 10, as $\frac{N}{100}$ alkali was employed, and from this product subtract the number of C.c. alkali necessary to produce the permanent pink color—the remainder will be the number of C.c. of $\frac{N}{100}$ hydrochloric acid combined with the alkaloid, and from this can readily be calculated the actual amount of pure alkaloid present, by means of the proper multiplication factor.

In the case of drugs containing several alkaloids, the results can only be calculated as of totals, our methods of assay thus far giving only imperfect and unsatisfactory separation, and the multiplication factor used must be found from the mean of the molecular weights of the alkaloids known to be present; thus for cinchona bark the mean of the molecular weights of the four alkaloids—quinine 324, quinidine 324, cinchonine 303, cinchonidine 308—would be 315, and hence each C.c. $\frac{N}{100}$ hydrochloric acid will be equivalent to 0.00315 total alkaloids; for nux vomica the mean of the molecular weights of the two alkaloids—strychnine 334, brucine 394—would be 364, and hence each C.c. $\frac{N}{100}$ hydrochloric acid will be equivalent to 0.00364 total alkaloids.

——— *Indicator in.*—The alkalimetric estimation of the alkaloids extracted in a crude state has been very unsatisfactory, due to the lack of a suitably sensitive indicator; as such A. Partheil recommends iodo-eosin, but to be of advantage it must be used in an ethereal solution (0.002 in one liter ether). To the acid solution of the crude alkaloid 20 C.c. of this ethereal solution are added, when after agitation the aqueous solution will be colorless and the ethereal solution nearly so; by titrating with $\frac{N}{100}$ alkali and agitating, the least excess of alkali causes the iodo-eosin to dissolve in the aqueous solution with rose-red color. The titrations require considerable time and must be carried out in stoppered flasks, but these inconveniences are balanced to a certain extent by the indicator allowing titrations to be made with $\frac{N}{1000}$ alkali. The indicator is suitable for the estimation of strychnine, brucine, atropine, hyoscyamine, aconitine, coniine, morphine and cytisine; quinine cannot be titrated with it, probably for the reason that this alkaloid is so very soluble in ether and so insoluble in water.—Apoth. Ztg., 1892, 435; Am. Jour. Pharm., 1892, 522 (see also Pharm. Rund., 1892, 246).

Volumetric Determination of Acids in Alkaloidal Salts, with Phenolphthalein as an Indicator.—P. C. Plugge, Pharm. Review, 1892, 234; Trans. from Archiv. der Pharm., 1887.

Standardization of Powdered Drugs.—Editorial, Pharm. Record, 1892, 263.

Alkaloidal Determination in Narcotic and other Extracts.—A new

method. By Van Ledden-Hulsebosch in Pharm. Post, 1893, 153; Pharm. Centralh., 1893, 101.

Belladonna Preparations—standardization of.—John Barclay. A valuable contribution to this subject. The original article see Pharm. Jour. Trans., 1893, 740.

Calabar Bean, Cinchona Barks, and Nux Vomica—Note on Assay of. C. P. Beckwith.—Bull. Pharm., 1892, 606.

Cinchona Alkaloids—Assay of.—E. H. Jane has made a series of experiments employing De Vrij's chromate test and Schaefer's oxalate test. He finds the latter inferior to the former.—Pharm. Jour. Trans., 1893, 838.

Cinchona Assay.—As an improvement upon Haubensack's method (Proc. 1892, 745), which by Wegmüller was pronounced to be the best method yet proposed, C. Kürsteiner publishes the following and invites comparison of the two methods: 20 grams cinchona in very fine powder are placed in a flask of 400–500 C.c. capacity and moistened with 5 grams dilute hydrochloric acid (spec. grav. 1.060) and 30 grams strong alcohol; after standing for two or three hours, 15 grams water of ammonia (10 per cent.) and 170 grams ether are added, and repeatedly agitated during 5–6 hours; 100 grams of the liquid are decanted into a separating funnel of 300 C.c. capacity, containing 50 grams water and 2 grams dilute sulphuric acid, sp. gr. 1.117 (or sufficient to impart an acid reaction after agitation with the ethereal solution), agitated repeatedly and then allowed to stand for at least one hour, when the aqueous layer is transferred to a beaker, warmed on a water-bath to 40° C. and returned to the separating funnel, which has been cleaned in the meantime. Ammonia water is carefully added until a distinct alkaline reaction results, and the alkaloids dissolved in a mixture of 30 grams chloroform and 10 grams ether by carefully rotating the funnel; after separating, the chloroform layer is removed to a tared flask, allowing it to filter through a small, plain filter; the extraction of the alkaloids is completed by using a second portion of solvent, 15 grams chloroform and 5 grams ether, allowing it to pass through the filter and washing the latter with chloroform. The solvent is then evaporated upon a water-bath and the residue weighed; multiplying by 10 gives the percentage of total alkaloids.—(Schwz. Wochenschr. f. Chem. and Pharm.) Pharm. Ztg., 1892, 750; Am. Jour. Pharm., 1893, 745.

Cinchona Bark by the Perforator Method—Examination of.—H. van Ledden Hulsebosch. Place three grams of the finely powdered cinchona bark to be examined and a mixture of 1.5 cubic centimeters of ammonia water, three cubic centimeters of stronger alcohol and 25.5 cubic centimetres of ether in a tightly closed container with a glass stopper; macerate for twenty-four hours with frequent agitation. From the upper layer of the fluid draw off with a pipette 10 cubic centimeters, (or with

a very poor specimen of bark 20 cubic centimeters) and place in a small beaker. Add one (or if necessary two) cubic centimeters of diluted hydrochloric acid and nine cubic centimeters of water, evaporate off the alcohol and ether by warming gently on a water bath and make sure that the residual fluid has an acid reaction. If this is not the case, add a few drops of hydrochloric acid.

On cooling, filter the liquid through a wad of cotton into the "perforator," rinse the beaker and funnel with a very small quantity of water, add the washings to the original liquid and treat the acid solution with ether for one hour, so as to remove all the ether-soluble impurities.

Now attach a new receiving flask to the perforator, render the acid liquid alkaline by the addition of a sufficient quantity of diluted soda solution and again treat with ether for two hours. Now evaporate off the ether in the receiving flask and then dry and weigh the residue; the weight of these residual alkaloids multiplied by 100 gives the percentage of alkaloids present in the sample. If 20 cubic centimeters of the extract from the bark are used, the weight obtained should be multiplied by 50 to obtain the percentage.—Pharm. Weekblad.; Amer. Drug. and Pharm. Record, 1893, 372. (Also Pharm. Centralh., 1893, 289.)

Quinine in Cinchona Barks—Estimation of.—20 grams of the finely powdered, air-dried bark are macerated, with frequent agitation, for 24 hours, with a mixture of 10 C.c. water of ammonia (sp. gr. 0.960), 20 C.c. alcohol (90 per cent.) and 170 C.c. ether: 100 C.c. of the clear liquid are then transferred to a beaker, 27 C.c. water and 3 to 4 C.c. normal hydrochloric acid solution added and set aside for 24 hours to allow the ether to evaporate; by placing the beaker in a water-bath, the alcohol and ammonia are next dissipated, adding, if necessary, sufficient hydrochloric acid to assure a neutral or faintly acid solution (should too much acid be added the excess is neutralized by the addition of *cinchonine*, thus preventing the introduction of ammonia or fixed alkali hydrates). The liquid at this stage should measure about 15 C.c. (greater concentration in presence of free acid frequently causes decomposition); after cooling a red-brown coloring matter generally separates, which is filtered out, and in the filtrate is then dissolved 2 to 3 grams Rochelle salt, the solution heated upon a water-bath for fifteen minutes and set aside for 24 hours. After filtering off the insoluble tartrates of quinine and cinchonidine (the filtrate is proven to be free from these alkaloids by warming with a little additional Rochelle salt), the tartrates are washed with as little water as possible and then drained; for each C.c. of original filtrate an allowance of 0.0008 Gm quinine, and for each C.c. of washings an allowance of 0.0004 Gm. quinine must be made. The tartrates are dissolved in water, using the smallest possible quantity of hydrochloric acid; this solution is thoroughly extracted with ether to remove soluble substances, and made alkaline with sodium hydrate, and now the alkaloids (quinine and cin-

chonidine) extracted by agitation with ether; this ethereal solution is evaporated and the residue dried at 100–110° C., and weighed. By treating this alkaloidal residue with a saturated solution of cinchonidine in ether, the quinine is dissolved; after decanting the solution, the residue is quickly washed with a few C.c. of pure ether, and dried at 100–110° C., to constant weight. To the difference between the two weighings must be added the correction for the solubility of the tartrate of quinine, and the sum represents the quinine in 10 Gm. of the bark. The quinine in the ethereal solution can be converted into tartrate, which will be beautifully white and suitable for polarization or for de Vrij's method of estimation.—J. H. Schmidt (apothecary in Soerabaya), Pharm. Centralh., 1892, 594.

Ipecacuanha—Assays.—The following criticism of the present methods of extracting emetine was arrived at after a considerable period of laboratory observations: (1) Zinnoffsky's method, titrating with Mayer's reagent, gave such discordant results that it was soon rejected. (2*a*) Flückiger's method, extracting the powdered root with hot chloroform-ammonia, is not complete after prolonged extraction (more than ten hours), and gives a residue which is largely contaminated with resinous substances. (2*b*) The method modified by Kremel, by dissolving the residue in dilute acid, liberating the alkaloid with ammonia and extracting with chloroform, gives very low results, since the alkaloid is not completely removed (ten extractions with 30 C.c. chloroform failing to remove it entirely); the greater the excess of ammonia used the greater the difficulty. Experiments proved that if pure emetine dissolved in water be agitated repeatedly with chloroform the fifth extraction was found free from alkaloid; hence the deduction that the root contains substances soluble in chloroform, which later prevent the removal of emetine, or again, it was found that heat rapidly decomposed the alkaloid; a temperature of 50° C. turns it of a brown color and causes it to react differently towards reagents. (3) Kremel's assay, drying a paste made of root, lime and water and extracting with chloroform, was shown to give low results, owing to the difficulty in extracting (after thirty hours the residue was not exhausted), and that the residue obtained was not soluble in dilute acid. (4) The extraction of the root with ammoniacal alcohol, evaporating to dryness and exhausting with chloroform, also gave low results, but here the explanation, verified by experiment, is that emetine warmed with solutions of ammonium salts causes the liberation of ammonia, and then the alkaloidal salt produced escapes extraction by the chloroform. (5) A modification of Lloyd's method gave low results, a residue almost black and impure, and incomplete extraction. This method, however, suggested the following one, which gave the best and most exact results. (6) It is advisable to extract the powdered root without drying it, since heating makes the extraction of the alkaloid more difficult; moisture should, therefore, be estimated in a separate portion. 15 Gm. powdered ipecac are placed in a bottle with 148 C.c. 90 per cent.

alcohol and 2 C.c. hydrochloric acid, sp. gr. 1.12 (measured at 15° C.), and digested, with frequent agitation, at 40° C. for four days; after cooling to 15° C., 100 C.c. are removed, mixed in a capsule with 20 C.c. of a 1 oper cent. alcoholic lead acetate solution (50 per cent. alcohol) and, after the addition of 1.5 Gm. slaked lime, evaporated, with occasional stirring, to a pasty consistency; 5 Gm. powdered glass then incorporated, heating continued on a water-bath with constant stirring until a dry powder results; this is then extracted for 10 hours with chloroform, the chloroform solution evaporated in a weighed vessel, dried at 100° C., and weighed. This gives a crude alkaloid, which is then dissolved in 2 C.c. normal hydrochloric acid, the insoluble matter gotten upon a weighed filter, thoroughly washed, dried and weighed. The total residue minus the weight of the insoluble resin leaves the weight of the pure alkaloid.

The percentages as given below are calculated to dried drug; in methods (4) and (5) after repeating the extraction and making allowance for resin present, the percentages agree closely with those in method (6).

Ipecac.	2a. Per Cent.	2b. Per Cent.	3. Per Cent.	4. Per Cent.	5. Per Cent.	6. Per Cent.
Rio.....	3.09, 3.12, 3.00	1.72, 1.86	1.72	1.74	2.60	2.37, 2.24
Singapore ..	3.04	1.62, 1.74	—	—	—	2.22, 2.30
Carthagena .	2.24, 2.10	1.23, 1.38	—	—	—	1.81

—G. Kottmayer, Pharm. Post, 1892, 913 and 933; Am. Jour. Pharm., 1892, 519.

——— *Fluid Extract of.*—8 grams of the fluid extract are diluted with 8 grams water in an ordinary vial, 32 grams chloroform and 48 grams ether added and thoroughly agitated; 4 grams water of ammonia are next added, and the mixture frequently agitated during half an hour. After separation 50 grams of the chloroform-ether solution representing 5 grams of the extract are poured or filtered into a tared flask and the solvent distilled off; the varnish-like residue is twice treated with 5 to 10 C.c. ether and evaporated by forcing a current of air into the flask by means of a rubber bulb; after the last traces of ether have been removed and the residue dried in a water-bath, it is weighed. For the titration the alkaloid is dissolved with the aid of heat in 10 C.c. absolute alcohol and sufficient water added to give a permanent turbidity; after adding one or two drops hæmatoxylin solution, $\frac{1}{10}$ N-hydrochloric acid is added until the violet-red color changes to a pure pale-yellow. Emetine, according to Kunz, is diacid and has the formula $C_{30}H_{40}N_2O_5$, mol. weight 508 (by a control experiment with pure emetine this formula was found to be correct; the older formula $C_{29}H_{20}N_2O_5$, however, is still to be found in some recent standard works) the equivalent weight, therefore, is 254 and 1 C.c. $\frac{1}{10}$ N-hydrochloric acid represents 0.0254 grams emetine. In various samples of fluid extract of ipecac made from the same drug by different methods, 2.54–2.59 per cent. emetine was found.

The statement, recently published by Cæsar & Loretz, that the best selected ipecac root yielded at the most 1.85 per cent. emetine, caused the investigation to include the assay of the crude drug. The process used in the analysis just-quoted was proposed by Kremel; in it the finely powdered drug is mixed with calcium hydrate and water and dried in a steam-bath before extracting with chloroform; after 6 hours' extraction 0.82 per cent. emetine; after 4 hours' further extraction 0.12 per cent. additional was obtained, or by 10 hours' extraction 0.94 per cent. emetine; various modifications of the method did not give more favorable results. The reason for the small yield of alkaloid is no doubt due to the gelatinizing of the starch, and in the subsequent drying this covers the cellular tissue so that the cell contents cannot be acted upon by solvents. From these experiments results a practical and reliable method for the

Assay of the Root.—10 grams of the finely powdered and dried (at 100° C.) root is placed in a dry bottle of 150 C.c. capacity, 40 grams chloroform and 60 grams ether added and thoroughly mixed by agitation for several minutes; by the addition of 10 grams of water of ammonia the suspended powder separates almost immediately, while the emetine is dissolved; frequent agitation during one hour is followed by a further addition of 5 grams water of ammonia, which upon agitation causes the powder to agglutinate into a lump, while the liquid becomes perfectly clear and if necessary could be almost completely poured off. Fifty grams of the alkaloidal solution, representing 5 grams of the dried root, is then transferred to a weighed Erlenmeyer flask, and the process completed as described under the assay of the fluid extract. The titration in this case is a little more difficult because of the extraction of a little fat from the root (the average of six determinations of fat in ipecac gives 0.31 per cent.); an improvement of the assay process consists in extracting the fat from the dried powdered root before submitting it to the assay. For this purpose 10 grams of the powder are placed in a small glass funnel closed with a plug of cotton and percolated with ether until the latter runs through colorless, usually 15–20 C.c. suffice; then with a glass rod the cotton and powder are pushed through the funnel into a dry, weighed bottle of 150 C.c. capacity and washed with ether until the weight of the ether in the bottle equals 60 grams, then add 40 grams chloroform, etc., as before. By this preliminary treatment the alkaloid solution remains almost perfectly clear during the titration. Assays made with six samples of ipecac root (No. 5, the root used in making the fluid extracts; No. 6, a selected Carthagena-ipecac from Cæsar and Loretz) gave the following results:

	1	2	3	4	5	6
	Per Cent.					
Emetine by weighing the residue	3.032	3.078	3.148	3.028	2.620	2.700
Emetine by titrating the residue	2.794	2.743	2.844	2.743	2.565	2.438
Difference between the two	0.238	0.335	0.304	0.285	0.055	0.262

From these results a pharmacopœial requirement of 2.5 per cent. emetine in the ipecac root would not be too exacting. As the objection that the assay determines not only emetine but cholin may be raised against this method, the alkaloidal residue from 50 grams of the root was dissolved in dilute alcohol, neutralized with hydrochloric acid, evaporated to dryness, and dissolved in a little water; this solution, which should contain the cholin as hydrochlorate, was distilled with baryta water, but the distillate was found to be entirely free from cholin.—F. X. Moerk in Am. Jour. Pharm.; from Schweiz. Wochenschr. f. Chem. u. Pharm., 1892, 501 and 509.

Jalap—Assay of.—By F. H. Alcock. The author recommends a process which depends upon the greater solubility of jalap resin in amylic alcohol and the comparatively small solubility of amylic alcohol in water, and is as follows: One gram of powered jalap—free from agglutinated lumps—is placed in a suitable bottle, and 20 C.c. of amylic alcohol are added and shaken well from time to time. After a few hours pass the liquid through a little cotton wool into a glass separator, wash out the bottle with 5 C.c. amylic alcohol and place the washings on the marc in the funnel; repeat with 5 C.c. more if necessary, so as to ensure the presence of all the resin in the separator.

Now, shake up the amylic solution of the resin with small quantities of water at 50° C. (equal measures of hot and cold water will do), set aside for the liquids to separate, remove the lower aqueous layer, and repeat the washing with water until nothing more of a non-resinous nature is removed. Afterwards transfer the solution of the resin to a weighed dish containing 10 C.c. distilled water, wash out the separator with a little amylic alcohol, placing the washings in the dish, evaporate on a water-bath in the usual way, and when dry, weigh.

The advantages of this method are:

(1) That less of the water-soluble matter is removed than by the official process.

(2) After careful treatment with the amylic alcohol no resin remains, rectified spirit dissolving from the residue only water-soluble matters and no resin.

(3) It is a cheap process, because common fusel oil once distilled can be used, but in this case more water-soluble matter is removed and more washing required.

The use of the water when evaporating off the amylic alcohol is to prevent the alcoholic solution creeping over the sides of the dish, and consequent loss of resin.

As the vapor of amylic alcohol is not a pleasant one to inhale, the evaporation is best conducted under a good flue.

An examination of many samples of commercial powdered jalap sold in Birmingham and district confirms the often expressed opinion that the

official standard of 10 per cent. of resinous constituents is too high at the present date.—Phar. Jour. and Trans., 1892, 107; Am. Jour. Pharm., 1892, 533.

Nux Vomica—Assay of Alkaloidal Preparations exemplified by that of Fluid Extract of.—J. U. Lloyd. The original feature of the method of assay described by the author is similar to that offered for fluid extract of guarana (see Proc. 1892, 453). This valuable paper cannot be satisfactorily abstracted. See original in Amer. Jour. Pharm., 1892, 337–353.

Morphine in Opium.—Determination of.—Cannepin and Eijkman, Union Pharm., May, 1893; Rép. de Pharm., 1893, 249.

Laudanum Assay.—Lyman F. Kebler. The author uses a modification of Dr. Squibb's process, which is as follows: Place 100 C.c. of the laudanum to be assayed into a tared capsule of about 250 C.c. capacity, evaporate on the water-bath, occasionally stirring, until the contents of the capsule weighs about 20 gm., while yet warm add 80 C.c. of cool distilled water slowly, stirring constantly. Allow the capsule and contents to stand until cool and the insoluble matter has completely subsided, then pour the clear liquid on a well-wetted filter of about 9 cm. diameter, so folded that the lower part of the cone shall hang free from the sides of the funnel. The filtrate is received into a beaker marked at 135 C.c. After the liquid has all been poured out of the capsule, about 10 C.c. of water are added and the residue removed from the sides and bottom of the capsule by means of a rubber tipped stirring rod and transferred to the filter; two similar subsequent treatments should suffice to remove everything from the capsule to the filter. If filtering is begun before the insoluble matter has subsided, it will be very tedious and unsatisfactory, for some of the finer particles are not retained by the filter until it is clogged. Wash the residue on the filter well with small portions of water, allowing each portion to drain completely before a subsequent addition is made, until the residue is exhausted and the filtrate measures about 135 C.c. Place the filtrate into a tared capsule of about 250 C.c. capacity and evaporate on the water-bath, stirring occasionally, until the filtrate is reduced to 14 Gm.; while yet warm pour into a tared flask of 100 C.c. capacity. The portion remaining in the capsule is transferred to the flask by successive rinsings of about 2 C.c. of water, and finally enough water is added to make the solution weigh 20 Gm. The precipitating, separating, washing and drying is executed as is outlined in the Ephemeris, except that the morphine is more thoroughly washed with water, so that the mother liquor and the washings measure 65 C.c. instead of 50 C.c.—Am. Jour. Pharm., 1893, 209.

——— F. X. Moerk gives a process for the assay of opium, which he has found satisfactory in the assay of laudanum, and can, no doubt, be used for other preparations. It consists in the evaporation of 70 grams of the laudanum sample to a syrupy consistence. 2 or 3 grams are evaporated

to ascertain the amount of total solids. (This figure should be close to 60 per cent.) Calculation is then made to find the total solids in the 70 grams taken for the assay; the syrupy liquid from the 70 grams is then made up by adding water to a weight obtained by adding the total solids to 10 Gms. (10 C.c. water). (It has been found easier in the U. S. P. process to thoroughly incorporate the opium and lime with 10 C.c. water than with 20 C.c., hence the above change.) 3 grams slaked lime are then added to the contents of the capsule and thoroughly stirred with a pestle until a uniform mixture results; by the gradual addition of the remaining 60 C.c. water this mixture is rinsed into a flask or beaker, and then frequently shaken or stirred during one-half hour. After filtering 50 C.c. of the filtrate are mixed with 5 C.c. alcohol and 25 C.c. stronger ether, and after thorough agitation 3 grams ammonium chloride are added, and the U. S. P. directions further followed.—Am. Jour. Pharm., 1892, 354.

Semen Paullinia and Pasta Guaranæ.—H. Thoms gives the following method of assay for these substances; the method is a suitable modification of Waage's tea assay: An intimate mixture of 10 grams of the finely powdered seeds (or guarana) and 2.65 grams recently slaked lime is mixed with 100 Gm. water, evaporated in the water-bath to 60 Gm., then mixed with 50 Gm. solution of subacetate of lead and 10 Gm. fine sand, and evaporation continued to dryness; the residue is extracted in a Soxhlet apparatus with chloroform; after distilling off the solvent the crude caffeine is dissolved in warm water, allowed to cool, filtered into a weighed dish, evaporated to dryness, dried at 100° C. and weighed. The published statements that the drug contains from 3.9—5.0 per cent. caffeine (due to faulty assays) should be reduced according to Thoms' assays to 2.6–3.0 per cent. Prof. E. Schär some time ago announced that from the acid solution of guarana ether extracted a crystalline substance behaving like morphine in some of its reactions; this same crystalline substance Thoms found to be present in the seeds, and therefore to be a characteristic constituent of these two drugs.—Pharm. Centralh., 1892, 431; Am. Jour. Pharm., 1892, 525.

Pepsin Assay.—M. B. Mainwaring gives an important method for testing the proteolytic powers of pepsins which is as follows: Prepare a sufficient quantity of acidulated water, containing 0.2 per cent. absolute hydrochloric acid (HCl), thus:

Hydrochloric acid, U. S. P.	48 min. or 3 C.c.
Distilled water sufficient to make	16 fl. oz. or 473 C.c.

For every 1,000 grains of albumen required provide 2.17 fresh eggs. Put the eggs in boiling water and boil for fifteen minutes, then cool them with cold water. Separate the whites by the aid of a perfectly clean and bright spatula (preferably of bone), and if necessary, wash away any ad-

hering yolk and dry the coagulated albumen with a clean towel. Press the whites through a 30-mesh hair sieve; avoid, if possible, using a brass sieve.

The acidulated water and the coagulated albumen being ready, as also a water-bath at a temperature of 105° F.,

Weigh *exactly*, pepsin	½ gr.
Weigh with approximate accuracy coagulated albumen	1250 gr.
Measure acidulated water	27 fl. oz.

Carefully transfer the pepsin to a wide-mouthed bottle or flask of about 2½ pints capacity, adding a little of the measured portion of aciduated water. If the pepsin is in scale form. and the day is damp, so that the pepsin is inclined to become sticky, it should be weighed as quickly as is consistent with accuracy on a balanced watch-glass or evaporating dish, and if any sticks to the dish it must be rinsed out with some of the acidulated water, and thus all transferred to the bottle or flask. The weighed albumen is to be triturated in a small mortar with some of the acidulated water, and the mixture then poured into the bottle containing the pepsin, using the remaining acidulated water for rinsing purposes. The corked bottle and contents are now to be subjected to the heat of the water-bath, maintained at 105° F., as nearly as possible, for six hours, being well shaken not oftener than once every five minutes and at least every ten minutes, always restoring the bottle to the bath quickly. At the end of six hours, if the pepsin tests 1 : 2,500, not more than a few undissolved flakes should remain, consisting mostly of the membraneous portion of egg.

If the means of weighing are sufficiently accurate, it is an advantage as regards labor and time to use ¼ gr. of pepsin instead of ½ gr., reducing correspondingly the albumen and acidulated water, or, accuracy may be attained and still less materials used by thoroughly triturating in a small Wedgewood mortar 1 gr. of a pepsin with 9 gr. sugar of milk, 1¼ gr. of the mixture containing ⅛ gr. of the pepsin. The greatest care is necessary in weighing the pepsin, for $\frac{1}{100}$ part of a grain of a 1 : 2,500 test pepsin dissolves 25 gr. of albumen. Prescription weights and scales are generally far too inaccurate for operating with less than ½ gr. of pepsin. It is certainly advisable to provide a set of accurate grain weights.

The foregoing proportions of materials are given for the purpose of enabling one to prove whether or not a pepsin test 1 : 2,500; or, which of two or more brands most closely approximates this power, in which case the same *quantities* of materials are always to be used.

If testing a pepsin claimed to be of higher or lower power than 1 : 2,500, it is necessary to observe the same conditions given, and maintain the same proportions of albumen and acidulated water, varying only the quantity of pepsin—for instance, in testing a 1 : 2,000 pepsin use one-fourth more pepsin, thus, albumen 1,250 gr. + acidulated water 27 fl. oz. + a 1 : 2,000 test pepsin ⅝ gr., or of a 1 : 2,500 test pepsin ½ gr.

A 100 Minute Assay.—The author has found that any pepsin tested under the following conditions will dissolve exactly one-half as many times its weight of coagulated albumen as by the 6-hour test in 100 to 105 minutes. We can thus obtain reliable results without so much sacrifice of time—a pepsin dissolving 1,000 times its weight of albumen at 125° F. in 100 minutes, will dissolve 2,000 at 105° F. in six hours. The conditions are: The same relative proportions of the acidulated water and albumen as by the long-time test; but one-half of each as compared with the weight of pepsin used; temperature 125° F.; agitation every 5–10 minutes; time 100–105 minutes; practically complete solution of all the albumen present. Hence the following formula—for the sake of even numbers and a unit, a 1 : 2,000 test pepsin is designated.

Take pepsin (1 : 2,000 by the 6-hour test)	0.01	parts, or Gm. or ¼ gr.
Coagulated egg-albumen, (fresh egg, boiled 15 minutes, white pressed through 30-mesh hair sieve)	10.	parts, or Gm. or 250 gr.
Distilled water containing 0.2 per cent. HCl	100.	parts, or Gm. or C.c. or 5½ fl. oz.

Using the above designated number of grams, a flask is required of at least 100 C.c. capacity when about two-thirds full; 5½ fl. oz. for the grain weights given. For every 100 Gm. of albumen required provide 3.33 fresh eggs. Measure the prescribed quantity of acidulated water at ordinary laboratory temperature. Put the pepsin in the flask with a little of acidulated water; follow with the albumen, previously triturated with some of the acidulated water; rinse mortar and neck of flask with remaining acidulated water, and immediately set flask in a water bath, which is already at 125° F. Maintain this temperature within a degree above or below for 100–105 minutes, rotating flask every 5–10 minutes. If several tests are to be compared as to relative quantities or residual albumen, should there be any, the flasks should be rapidly cooled to below 60° F. In determining the power of different pepsins, the only allowable variation from above formula should be the proportion of pepsin—of a pepsin testing 1 : 2,500 in 6 hours, 0.008 Gm. would be required to do the work of 0.01 Gm. of a pepsin testing 1 : 2,000 by the 6-hour test.—Am. Jour. Pharm., 1892, 505–508.

BALSAMS.

Balsams and Resins.—Helfenberger Annalen, 1891; Pharm. Centralh., 1892, 424. An examination of their solubilities in different solvents.

BOUGIES.

Bougies—Manufacture of, on a Small Scale.—G. Ludewig describes a process in Canad. Drug.; Pharm. Jour. Trans., 1892, 362.

CAPSULES.

A New Capsule made by the Merz Capsule Co. is described by J. W. England in Am. Jour. Pharm., 1893, 7. The author's experience is limited and unfavorable to their use.

Gelatin Capsules.—Pharm. Centralh., 1892, 512.

Glycerin Suppository Capsule.—Pharm. Centralh., 1892, 513.

CHARTA.

Charta Sinapis.—Schlicht obtains results corresponding to those of Dieterich in his estimation of mustard oil, but his method is no improvement upon the latter.—Helfenberger Annalen, 1891; Phar. Centralh., 1892, 425.

——— Dieterich states that a good mustard paper should contain in 100 square centimeters (about sixteen square inches) at least 1.5 gram of mustard flour; which should give off at least one per cent. of the volatile oil of mustard.—Meyer Bros. Drug., 1893, 39.

CRAYONS.

Crayons of Ichthyol—Hirigoyen's Formula.—Bull. Pharm., 1892, 612.

——— *Lactic Acid.*—H. M. Whelpley in Bull. Pharm., 1893, 16.

——— *Zinc Chloride.*—Dumontpallier (Rev. invent. techn. through Monit. pharm., 1892, 1119) takes 20 Gm. of zinc chloride in very fine powder, adds to it drop by drop sufficient water to make a mixture of syrupy consistency, and then incorporates with it in small quantities 40 Gm. of rye flour. The mass is then divided into quantities of 4 Gm. each, which are rolled out to the thickness of 5 mm. and to 15 cm. in length. The crayons are then heated to 50° C. to give them a certain hardness and elasticity. They are kept in sterilized lycopodium.—Am. Jour. Pharm., 1893, 14.

DECOCTA.

Cinchona—Decoction of.—Lambotte's process. Make a decoction of 1 kgm. of cinchona, filter at a temperature of at least 70° C., evaporate to 400 C.c. on a water-bath, and add to the cooled liquid 100 C.c. alcohol, which dissolves the precipitate formed during the evaporation; now make up the volume to 500 C.c. by the addition of distilled water. This liquid represents double its weight of cinchona. To make a decoction of (say) 100 Gm., 5 C.c. of this extract are added to 95 C.c. *boiling* water, which keeps it in perfect solution, even after cooling, and has the same appearance as that made extemporaneously, while if the liquid is added to cold water, an abundant precipitate is produced.—Jour. de Pharm. et de Chim., Nov., 1892; Am. Jour. Pharm., 1893, 76.

——— *and Acid Infusion of.*—J. W. Thomson reports on the results of some experiments made by him to determine the extent to which the bark is exhausted in making these two preparations. He reports not only the

amount of total alkaloids, but also per cent. of quinine and cinchonidine, and the results are somewhat striking, as seen in the following table (the same sample of bark was employed in all of the experiments.) :

	Per cent. total alkaloids.	Per cent. quinine and cinchonidine.
Bark contained	6.20	4.05
B. P. infusion	4.94	1.91
Loss	1.26	2.14
Cold infusion for two hours	4.16	1.35
Loss	2.04	2.70
B. P. decoction	3.47	1.41
Loss	2.73	2.64

From the above it will be seen that in the case of the B. P. infusion there is a loss of 20.3 per cent. of the total alkaloids, and a loss of 52.63 per cent of the quinine and cinchonidine ; in the case of the cold infusion there is a loss of 32.9 per cent. of the total alkaloids, and a loss of 66.3 per cent. of quinine and cinchonidine ; and in the case of the decoction there is a loss of 44 per cent. of the total alkaloids, and a loss of 65.6 per cent. of the quinine and cinchonidine. From this it is evident that while there is least loss in the case of the official acid infusion, there is in every case a considerable loss, and that this loss is chiefly in the more important alkaloids, quinine and cinchonidine.—Phar. Jour. Trans., 1893, 841.

ELIXIRIA.

Elixir of Cascara Sagrada.—Dujardin-Beaumetz (Gaz. gynécologique) recommends the following as a remedy for constipation : Fluid extract of cascara sagrada, 90 Gm. ; pure glycerine, 90 Gm. ; alcohol of 90 per cent., 200 Gm. ; simple syrup, 400 Gm. ; oil of orange 6 drops ; oil of cinnamon, 2 drops, and sufficient distilled water for 1 litre. Dose—a wineglassful after meals.—Am. Jour. Pharm., 1893, 75.

——— *Iodine—Compound.*—West. Drug., 1892, 333.

——— *Phosphate of Iron, Quinine and Strychnine.*—F. A. Sieker proposes the following as furnishing a preparation that will not precipitate :

Phosphate of iron	256 grs.
Quinine sulphate	128 grs.
Strychnine	$1\frac{1}{4}$ grs.
Citric acid	15 grs.
Alcohol	5 fl. ozs.
Spts. orange comp. N. F.	100 m.
Syrup	6 fl. ozs.
Water sufficient to make	1 pint.
Aqua Ammoniæ	q. s.

Triturate the quinine, strychnine and citric acid in a mortar ; add the alcohol, comp. spts. of orange and the syrup—previously heated to about

65° C. Dissolve the phosphate of iron in 4 fl. ozs. of water, and add this to the solution first prepared; and after having mixed these solutions, add enough water to make 1 pint. Carefully neutralize with aqua ammoniæ, allow to stand for some time, if convenient, and filter.

In order to determine whether the citro-chloride has been substituted for the phosphate of iron, add a drop of hydrochloric or sulphuric acid to about 1 drachm of the elixir. If it contains phosphate or pyrophosphate of iron, a precipitate will form; but, on the contrary, if it contains the citro-chloride, only a change in color will be observed.—Notes on New Rem., 1893, 21.

——— *Ammonium Valerianate.*—H. Kahn recommends the addition of ten minims of chloroform, instead of six, to each pint of elixir of the National Form.—Apothecary, Aug., 1892.

EMPLASTRA.

Emplastrum Cantharidum Ordinarium.—Helfenberger Annalen, 1891; Pharm. Centralh., 1892, 425. It is pointed out by E. Dieterich that by the addition of an acid the activity of cantharidal plaster is greatly increased, in fact almost a hundred per cent. He proceeds as follows, the proportions of the ingredients being adjusted, of course, to meet the requirements of the German Pharmacopœia: Melt together 100.0 olive oil and 525.0 yellow wax, then add, stirring well, a mixture of 1.0 sulphuric acid (sp. gr. 1.838) and 10.0 alcohol (90 p. c.); when well incorporated, add 250.0 cantharides in fine powder. Maintain a temperature of 60° to 70° C. for two hours, stirring occasionally, and, lastly, incorporate 2.0 barium carbonate rubbed up with 6.0 alcohol.

Sticking Plaster from Nitrocellulose.—A patented preparation by C. Bensinger.—Zeits. Oest. Apoth. Ver., 1892, 803.

EMULSIONES.

Emulsion of Cinnamic Acid.—Landerer, in Wien. Med. Presse.

Cinnamic acid	G.	5
Oil of sweet almonds	"	10
Yolk of egg, fresh	No.	1
Solution of sodium chloride, 0.7 per cent., enough to make	G.	100

Triturate the cinnamic acid with a little oil, then add the balance of oil, then the yolk of egg, triturate well, then very gradually (drop by drop) add the solution of sodium chloride. If not done carefully, the emulsion will appear gritty. Immediately before using, this acid emulsion is to be neutralized with a 25 per cent. solution of potassium hydrate. Combination taking place quite slowly, this latter process is not a rapid one, and the alkaline solution must be added at greater intervals. This emulsion is employed against tuberculosis intravenously by injecting 0.1 to

1.0 C.cm. of the 5 per cent. cinnamyc acid solution.—West. Drug., 1892, 258.

Castor Oil Emulsion.—Coupland recommends almond paste. The same author recommends acacia for menthol and yolk of egg for oil of turpentine.—Chem. and Drug., 1893, 733.

——— *Coal Tar Oil as a Substitute for Cresyl.*—The high price of cresyl induced M. Delahousse (Jour. de Pharm. et de Chim., Nov., 1892) to replace this by an emulsion of heavy coal tar oil (huile lourde de houille) obtained by the following formula: coal tar oil, (density 1.05), 50; pulverized colophony, 10; soda lye (sp. gr. 1.33), 6; green soap, 10. A syrupy liquid results, having the odor of cresyl, and acting like it in the presence of water. This preparation contains about 740 Gm. of coal-tar oil per litre, and is equal to cresyl in antiseptic and deodorizing properties. —Am. Jour. Pharm., 1893, 74.

Emulsions of Cod Liver Oil.—Examination of commercial varieties by H. Leffmann and W. Beam.—Med. News, May, 1892; Bull. Pharm., 1893, 272.

Cod Liver Oil with Malt Extract—Emulsion of.—W. H. Ballard.

Cod liver oil	4 fl. ounces.
Tragacanth, in powder	12 grains.
Extract of malt	3 fl. ounces.
Water	1 fl. ounce.

Mix the tragacanth by trituration in a mortar with the extract of malt; then add the cod liver oil gradually, with uninterrupted trituration, and finally the water in the same manner. Transfer the mixture to a twelve-ounce bottle and shake vigorously for a few minutes.—Apothecary, August, 1892.

Emulsion of Iodoform in Oil.—Garre in Corresp.—Bl. f. Schw. Aertze; Chem. Centralh., 1893, 40.

Salol Emulsion is prepared by melting 10 Gm. salol in a capsule or water-bath, transferring to a warm mortar, mixing with 5 Gm. powdered acacia, and emulsifying after the addition of 7.5 Gm. luke-warm water; this accomplished, 10 Gm. more of the warm water are added, and the mortar with contents allowed to cool before adding the remaining quantity of water. The salol will separate as a crust in the vessel, and agitation will not loosen it; prepared as directed, the salol separates as a very fine powder, and is easily incorporated by agitation. The emulsion has the odor of salol, but is nearly tasteless; sweetened with syrup it is a very desirable preparation for children. For dispensing, a concentrated emulsion is convenient, since it is also permanent.—Pharm. Post., 1891, 954.

Emulsion of Salol and Camphor.—M. Lerich, in *Bulletin méd. de l' Algerie*, gives the following process:

Mix ten parts each of salol and camphor in a mortar, and when the mixture is entirely liquefied add ten parts almond oil, then 15 parts gum arabic. Now add 30 parts distilled water, beat vigorously, and increase to 300 parts, added in small portions at a time.

Salol, 10 Gm., dissolved in almond oil 30 Gm., and injected subcutaneously, has been used by M. Grossi with good results in tuberculosis; he commences with 5 Gm. of the above solution per day, and increases to 20 Gm. The injections have generally no local action, but, when they have been repeated a number of times, must be discontinued for a while.—Med. Neuigk., through Nouv. Rem., 1883, p. 223; Amer. Jour. Pharm., 1893, 340.

Turpentine Emulsion.—H. Kahn gives a formula for this emulsion or that of any other volatile oil.

Oil	½ fluid ounce.
Tragacanth, powdered	30 grains.
Syrup	1 fluid ounce.
Water enough to make	4 fluid ounces.

To the oil of turpentine contained in a dry bottle add the tragacanth, and shake; add 1 fluid ounce of water, agitate vigorously. Then add the syrup in portions, shaking after each addition, and finally enough water, in portions, shaking after each addition, to make 4 fluid ounces.—Apothecary, Aug., 1892.

Emulsor—The Centrifugal.—M. Ekenberg describes a machine by the aid of which uncongenial fluids such as oil and water may be caused to mix mechanically most intimately. In consequence of its continuous work and productive power, the emulsor substitutes most satisfactorily usual means of bringing about a mixture, as employed in the tar industry, soap manufacture, etc. The apparatus is very simple, substantially made, and easily managed when in use. A full description will be found in Chem. News, 1892, 51.

EXTRACTA.

Menstruum for Extracts.—Acetic acid in strength of 60 per cent. has been used by E. R. Squibb as a solvent for drugs containing ethereal oils and aromatic resins. It is claimed to be prompt, effective and cheap compared to other solvents. Experiments made with nux vomica and belladonna proved the superiority of this menstruum to alcohol.—F. Hoffmann, Pharm. Rund., 1893, 40.

Extraction Appartus.—H. W. Wiley.—Jour. Anal. App. Chem., 1893, 65.

Assay of Fluid Extracts.—J. Stieglitz has continued his examination of the preliminary method already published (See Proc., 1892, 449), and its application in the assay of fluid extract of cinchona, with a trifling modifi-

cation, is fully verified. The author gives results of parallel analyses, using Prollius' mixture and a modification of Prollius' method. This direct method is not applicable to the assay of fluid extract of cinchona comp., Prollius' method being preferred. The author gives results of extended work by different methods upon the following fluid extracts: Belladonnæ folia and B. radix, stramonii sem., erythroxylon, quebracho, conii fructus, nux vomica, guarana, kola-nut, and colchicum root.—Pharm. Rund., 1892, 181.

——— E. Dieterich compares the relative values of the ether extraction method of Beckurts and Schweissinger and Sarnow and the Helfenberger aether-lime method. He questions the reliability of Lloyd's method in the assay of belladonna. He recommends the aether-calcium process for the qualitative examination of extracts.—Pharm. Rund., 1892, 191; from Helfenberger Annalen, 1891, 43–53.

——— G. P. Pattison has examined fluid extract of guarana by Lloyd's method and fluid extract of belladonna root by comparison methods of Lloyd and Thompson.—Pharm. Rund., 1892, 239.

Fluid Extracts—Examination of German.—O. Lind examined the preparations of Dieterich, Riedel, Böhringer and Son, P. D. and Co., and compared them with a standard made according to the German Pharmacopœia. The following are the results:

Ext. Cascara Fld.—Standard sample, sp. gr. 1.078, dry residue, 28 per cent. The commercial samples varied from sp. gr. 1.043 to 1.081, with 18.04 to 28 per cent. dry residue.

Ext. Condurango Fld.—Standard, sp. gr. 1.031 and dry residue 20 per cent. Commercial, from sp. gr. 0.970 to 1.025 and 8.9 to 19.65 per cent. dry residue.

Ext. Secalis Cornuti Fld.—Standard, sp. gr. 1.050 and 16 per cent. dry residue. Commercial, sp. gr. 0.995 to 1.052 and 18.47 dry residue.

Ext. Frangula Fld.—Standard, sp. gr. 1.038, dry residue 20 per cent. Commercial, sp. gr. 1.022 to 1.024, dry residue 11.30 to 20.90 per cent.

Ext. Hydrastis Fld.—Standard, sp. gr. 0.972, dry residue 22 per cent. Commercial, sp. gr. 0.933 to 1.017, dry residue 11.68 to 20.34 per cent.—Pharm., Centralh., 1892, 517–520.

Standardizing of the Fluid Extracts of the Pharmocopœia.—J. P. Russel. P. C. P. Alumni Rep., 1892, 60. The fluid extracts of *Belladonna* of the trade varied in sp. gr. from 0.852 to 0.959; *Aconite*, from 0.884 to 1.038; *Cinchona*, from 0.964 to 1.136; *Nux Vomica*, from 0.870 to 0.912. The alkaloidal values were as follows:

Cinchona Extract, 3.95, 1.30, 1.45, 1.85, 1.575, 2.25 and 2.50. Of these the first and fourth were assayed for quinine, and gave respectively 2.55 and 0.72 per cent.

Belladonna, total alkaloids, 0.56, 0.18, 0.58, 0.40, 0.392, 0.40 and 0.48 per cent.

Aconite, 0.40, 0.60, 0.40, 0.64, 0.30, 0.36, and 0.36, aconitine of a light straw color, and crystalline.

Nux Vomica, total alkaloids, 2.12, 1.76, 2.60, 1.80, 1.00, 1.40 and 1.44.

Extracts—Examination and Estimation by Dieterich in Helf. Annalen. —Pharm. Centralh., 1891, 436.

Report on Some Pharmacopœial Extracts.—R. A. Cripps. The following extracts are considered: Extract. mezereiæ thereum; extract jalapæ; extract conii. The last two he would have removed from future editions of the British Pharmacopœia. Regarding the extract of mezereum, he recommends every pharmacist to make a trial of the solubility of this extract in ether before receiving it into stock.—Phar. Jour. Trans., 1893, 778.

Extracts, Fluid—The Manufacture of Non-Alcoholic.—F. Edel describes the manufacture of the following: Pinus canadensis, calendula, hamamelis, and hydrastis.—Pharm. Record. 1893, 41.

Fluid Extracts.—Comparison of market fluid extracts and their relation to 50 per cent. tinctures.—E. L. Patch, J. Am. Med. Assoc., 1893, 177.

Extracts containing Chlorophyll—Analysis of.—A. Etard.—Chem. Zeit., 1892, 216; from Compt. rend., 1892, 1116.

Fluid Extracts—Notes on.—Desvignes in Rép. de Pharm., 1893, 200.

Animal Extracts.—E. Delpelch. An account of the preparation of: 1. Cerebral extract; 2. Testicle extract; 3. Thyroid extract.—Phar. Jour. Trans., 1892, 445; adapted from a paper read before the Soc. de Pharm. de Paris.

Thyroid Extract.—By Edmund White. The use, hypodermically, of a glycerine extract of the thyroid gland of the sheep has been advocated as a remedy for myxœdema. The author gives the method of preparing an extract which has been used with satisfactory results in St. Thomas' Hospital. —Pharm. Jour. and Trans., 1892, 321.

Organic Extracts—Preparation of.—C. E. Brown-Séquard. A description with illustration of the sterilizing filter of d'Arsonval. Also the preparation of organic extracts.—Brit. Med. Jour.; Pharm. Jour. Trans., 1893, 1034.

Organic Extracts.—Their Preparation and Physiological and Therapeutic Effects.—W. A. Hammond.—N. Y. Med. Jour., 1893, 93; Ont. Med. Jour., 1892, 273; Post Grad., N. Y., 1893, 97.

Aspidosperma—Fluid Extract.—M. A. Miner finds the menstruum of the N. F. as effective in depriving the drug of its active constituents as strong alcohol.—Apothecary, Aug., 1892.

Extract of Beef and Pepsin.—By James T. Shinn. An account of a visit by him to the great packing establishment of Armour & Co. The

making of extract of beef and pepsin has been added to the other industries, and is of special value to pharmacists.

For the *extract of beef* prime lean, well trimmed meat is finely cut up and digested with steam heat in huge wooden vats; the juice is expressed, filtered through muslin, and sucked into vacuum pans, each capable of reducing seventy-five cubic feet to the proper consistence in thirty-five minutes. The facilities for obtaining the best and freshest meat from the finest cattle are obvious, and the use of improved machinery insures the absence of all unpleasant burnt taste.

In the preparation of the various *pepsins*, they have the great advantage of an unlimited supply of *perfectly fresh* hogs' stomachs, and can use from 10,000 to 14,000 daily. About two ounces are cut out of the whole stomach, the rest being rejected as inferior; the mucous membrane is scraped off and digested for six or eight hours in a dilute solution of muriatic acid, and by some peculiar process the *peptones* are eliminated, the solution clarified by settling at a very low temperature, and finally dried on glass plates. Saccharated pepsin is also made by Scheffer's process, and pepsins of various digestive power are put up for market.—Am. Jour. Pharm., 1892, 561, 562.

Beef Extract Industry of South America.—Pharm. Post, 1892, 858.

Extractum Cinchonæ frigideum paratum.—N. Noracek. This extract is prepared at a temperature between 0° and 20°, whereby necessarily the chemical and physical properties are very different from the usual solid extract.—Pharm. Post, 1893, 22.

Fluid Extract of Cinchona.—Examination by de Vrij in Pharm. Weekblad, (29, No. 46); Pharm. Centralh., 1893, 211.

Ergot—Liquid Extract of.—W. B. Cowe examined eight commercial samples. One-half showed the presence of copper. Results showed a perceptible variation in the percentage of extractive. In the case of an important preparation of this kind it would be an advantage to have in the Pharmacopœia such characters and tests as would secure the attainment of a reasonable standard of uniformity, and the author suggests the following: It should be a bright liquid of a rich reddish-brown color, having a specific gravity of 1.030 to 1.040, yielding at 105° C., 12 to 14 per cent. of extractive, readily soluble in warm water, and containing 20 to 30 per cent. by volume of rectified spirit.—Pharm. Jour. Trans., 1893, 841, 846.

Extractum Filicis Maris Wolmarense.—Pharm. Centralh., 1893, 113, 128.

Male Fern—Extract of.—Weppen and Lüders have prepared this extract in a number of ways, and found that it should possess a slight greenish color.—Apoth. Zeit., 1892, 514; Pharm. Centralh., 1892, 631.

——— *Alcoholic Extract of.*—Lanara uses the following in the treatment of eczema with good results: Alcoholic extract of male fern, 30 Gm.; extract

of myrrh and extract of opium, of each 4 Gm. This is applied twice a day after washing the affected parts with green soap and removing the scab.—Vratch, 1892; Nouv. Rem., 1893, 23; Am. Jour. Pharm., 1893, 130.

Extract of Liquorice—Purification of.—The extract broken into small pieces is dissolved in 6 or 7 times its weight of water; stirring facilitates the operation; into this solution while being stirred there is sifted powdered talcum (in amount equalling ⅓ of the extract taken), and then a quantity of water of ammonia (sp. gr. 0.960) added, sufficient to impart a faint odor ($\frac{1}{30}$ of the weight of the extract is generally sufficient); lastly, a weight of 90 per cent. alcohol is added equalling $\frac{1}{5}$ of the weight of the extract; after continued agitation for 10–15 minutes, the vessel is closed and set aside for 1½–2 days to allow the suspended matter to subside; the supernatant liquid will be found perfectly clear, and is separated by decantation; the turbid portion is diluted with water, filtered and washed, and the clear solutions are then evaporated. Another method, although an inferior one, differs from the above by using powdered glycyrrhiza, instead of the powdered talcum (10–12.5 per cent. of the weight of the extract); the separation requires longer time, and the sediment becomes more troublesome in washing. In these processes the powders are added to attract the suspended matter, and cause them to deposit; the ammonia is added to dissolve free glycyrrhizin, which is always present, and the alcohol to facilitate separation of the suspended albuminoid matter, also to prevent fermentation; in hot weather a larger proportion of alcohol may be required for this purpose. H. Hager, Pharm. Ztg., 1892, 650; Am. Jour. Pharm., 1892, 615.

Malt Extracts—Examination and Preparation of.—Helbing and Passmore, in Helbing's Pharmacol. Record, No. xii, Apoth. Zeit., 1892, 655.

——— *Diastatic Value of.*—H. R. Owen.—Pharm. Record, 1893, 262.

——— F. White gives some results on the time required for the complete conversion of definite quantities of starch by definite quantities of extract.—Chem. and Drug., 1892, 273.

——— Gehe and Co.—Pharm. Centralh., 1892, 555.

Malt Extracts—Analytical Notes on Liquid.—H. Leffmann.—Med. News, 1893, 100.

Perfume Extracts—Apparatus for Congealing.—Le Genie Civil; Amer. Soap Jour., Pharm. Era, 1892, 7.

Extractum Euphorbiæ Pilulifera Fluidum.—By E. S. Blair.—Euphorbia pilulifera administered in the form of fluid extract has been found useful in hay asthma, not only in the primary attack, but also in cutting short any recurrence of the affection.—Amer. Jour. Pharm., 1892, 584; Therap. Gaz., March, 1892.

Tamarinds—Fluid Extract of.—Xanthopoulos in Rev. Med. et Pharm.—

Tamarinds, fresh	2,560 parts.
Orange-flower water	100 parts.
Simple syrup	400 parts.

The tamarinds are placed in a percolator (after being cut into small pieces), and treated with water until the percolate comes away colorless. The percolate is filtered and the filtrate evaporated down to 1,280 parts. When cold, add the orange-flower water and syrup.—Nat. Drug., 1892, 101.

Taraxacum—Extract of.—L. E. Sayre prepared extracts from roots collected in September, October and November, and concludes that any root collected in autumn would furnish a reliable extract.—Notes on New Rem., 1892, 106.

Walnut—Extract of, for cosmetic purposes.—See Pharm. Post, 1892, 1146.

GAUZES.

Antiseptic Gauze.—Joseph Lister has further modified his instructions for the preparation of this material. The pure cyanide of mercury and zinc is tinted with hydrochlorate of mauveine, also known as purified rosolane. The mauve-colored powder is diffused with pestle and mortar in solution of carbolic acid (1 to 20), in the proportion of about thirty grains to a pint. Absorbent guaze, being folded in a thickness of eight layers, is then drawn through the liquid contained in a trough with a bar near its lower part, beneath which the gauze must pass. The salt is prevented from depositing by constant stirring. The gauze is dried at the temperature of the air. Before use the gauze should be damped by sprinkling alternate layers with carbolic lotion and rolling up the wet and dry pieces together, when the entire mass becomes uniformly wet in a few minutes. —Phar. Jour. Trans., 1893, 686.

Dermatol Gauze.—Formula according to Gay.—Chem. and Drug., 1893, 959; Pharm. Post, 1893, 320.

Gauzes and Cottons—Antiseptic.—E. Bourguelot gives the method of preparation of the principal antiseptic gauzes and cottons.—Jour. Pharm. Chem., 1892, 249 and 314.

Gauze, Adulteration of Iodoform.—In an article signed L. & D. (Bull. commerc., 1892, 186), attention is called to a peculiar sophistication of iodoform gauze. The gauze examined was marked 30 per cent., but on analysis showed only eight per cent.; the deficiency in color was made up with a nitro-derivate of phenol. To look for this adulterant it suffices to treat the gauze with water, when, if it be present, a yellow colored solution results, yielding on evaporation a golden yellow residue which, after being fused will not color ether and has lost its bitter taste.

Properly prepared iodoform gauze should yield no coloring matter to water. —Am. Jour. Pharm., 1892, 404.

Gauze, Assay of Iodoform.—If the material contain 5–10 per cent. iodoform, 4 grams are taken for the assay; if it contain more, a smaller quantity suffices; the material is placed in a 100 C.c. flask, 60 C.c. alcohol added, and boiled, using an inverted condenser, until the iodoform is dissolved. After cooling, alcohol is added to fill up to the 100 C.c. mark; of this solution a quantity is taken which represents from 200–300 milligrams of iodoform, placed in a flask connected with an inverted condenser, and boiled with a solution of 5 Gm. potassium hydrate in 5 C.c. water for one-half hour, or until some of the alcohol distilled over is odorless or gives no turbidity upon the addition of water; the solution is then evaporated to dryness, dissolved in water, acidified with nitric acid and the iodine determined with silver nitrate. In making the calculation allowance must be made for the space occupied by the material; thus if 4 Gm. of a 10 per cent. gauze were used, the gauze occupied a volume of 3.6 C.c., hence instead of having 100 C.c. of the alcoholic solution there are only 96.4 C.c.— G. H. Boldingh (Ber. der Niederl. Pharm. Ges.), Pharm. Ztg., 1892, 517; Am. Jour. Pharm., 1892, 567.

——— M. Francois.—Jour. Pharm. Chim., xxviii, 409.

GELATINA.

Gelatines, Medicated.—F. J. Wulling gives an account of some of the preparations of gelatines, which may be used as substitutes for collodion.— Pharm. Era, 1893, 243.

GLYCERITA.

Glycerite of Oil of Cade.—Ch. E. Quinquaud (*L'Union phar.*, 1893, 190) in the treatment of psoriasis commences by applying the following plaster to the diseased surfaces: Lead plaster, 600 Gm.; yellow wax, 300 Gm.; poppy seed oil, 600 Gm. The scales should be removed, and a lukewarm alkaline bath given for half an hour, using not more than 100 Gm. of carbonate of sodium for the bath. Upon leaving the bath the diseased parts should be anointed with the following glycerite: Oil of cade, 140 Gm., emulsionized with 15 Gm. fluid extract of quillaja; and glycerite of starch, 845 Gm. If this is well tolerated by the skin, it can be strengthened according to the following formula: Oil of cade, 460 Gm.; fluid extract of quillaja, 40 Gm.; glycerite of starch, 500 Gm. If untoward symptoms arise, accidents can be averted by administering 2 to 6 Gm. of salol during 24 hours.—Am. Jour. Pharm., 1893, 281.

Salol-glycerin.—Ten Gm. salol, 5 Gm. acacia and 7.5 Gm. water are emulsified as above and then after cooling diluted with glycerin to make 100 gm. It forms a thick, milky mixture, separating the salol as a very fine powder, which is readily incorporated again. Useful in throat affections,

and adapted for application with a brush.—A. Suchomel, in Pharm. Post, 1892, 954.

Tannin—Glycerole of.—The dark colored stratum on its surface has been found by H. F. Meier to be caused by chlorophyll derived from the galls.—Cal. Drug.; West Drug., 1892, 300.

GOSSYPIUM.

Cotton and Sublimate.—L. Vignon shows that cotton exercises a peculiar absorbent action on dilute solutions of corrosive sublimate, apparently dissociating the salt—as represented in the following equation, $HgCl_2 + H_2O = HgO + 2HCl$—and combining with the mercuric oxide thus formed. It has since been ascertained that whilst the mercury is chiefly fixed upon the cellulose in the form of oxide, a certain proportion of subchloride is also formed in the process, and increases, if the temperature be maintained at 60° for some hours, at the expense of the mercuric chloride and oxide. —Pharm. Jour. Trans., 1893, 807; from Compt. rend., 116, 517 and 645.

Collodium Cotton for Bandages.—Pharm. Post, 1892, 1146; Pharm. Centralh., 1892.

Anti-Nicotine Cotton.—For neutralizing the nicotine effect.—Notes on New Rem., 1893, 7.

Oxycellulose.—A. Nastjukoff states that oxycellulose forms a hydrazone or osazone, indicating the presence of an aldehyde or ketone group. He considers the oxycellulose of Witz to be a mixture of oxycellulose, having the formula $C_6H_{10}O_6$, with ordinary cellulose.—Bull. Soc. Ind. de Mulhouse, through Chem. Repert.; Pharm. Jour. Trans., 1892, 343.

INFUSA.

Infusion of Digitalis.—J. W. England revises the original formula for this preparation as follows:

Take of digitalis leaves, bruised	120 grains.
Water	14½ fluid ounces.
Ammonia water	90 minims.
Alcohol	1 fluid ounce.

Macerate for an hour, agitating well occasionally, filter, express residue, wash with water, and filter, to make 14½ fluidounces. Now, add 90 minims of ammonia water, 1 fluidounce of alcohol, and sufficient water to make the volume measure 1 pint.

A number of reactions are noted with various reagents upon the infusion.—Am. Jour. Pharm., 1892, 361.

——— *In Subcutaneous Injection.*—Fol. digitalis 0.30, aq. dest. 10.0., ft. infus. Dose, 1–3 injections daily.—Sem. Méd., 1892; Pharm. Post, 1892, 884.

Digitalis—Dose of.—The dose of digitalis for the abortive treatment of pneumonia is from 4 to 8 grams of the leaves, given in the form of infusion during twenty-four hours, according to Professor Petresco of Bucharest (Bull. gén. Thér., Paris, Feb., 1892, p. 20). The author states that the tolerance and the non-toxicity of such large doses are proved by observations on 755 cases as published in his Traité de thérapeutique in 1884, and in a number of theses sustained before the medical faculty at Bucharest.—Am. Jour. Pharm., 1892, 367.

Gelatinized Infusion of Digitalis.—Mention has been made in the Am. Journ. of Pharm., 1892, 406 and 458, that the gelatinizing of the infusion is due to the action of a minute organism, *Micrococcus gelatinogenus*, upon cane sugar; in a recent paper upon the products of the alteration of cane sugar, W. Braeutigam announces that there are produced dextran, dextrose and lævulose. The last is used as food by the organism, while to the formation of the first is due the gelatinizing. Dextran may be separated from the other products by precipitation with alcohol; it forms snow-white flakes, drying on a water-bath to a greenish-white, amorphous, horny mass, soluble in water. The aqueous solution with Fehling's solution gave a pale blue, slimy precipitate, without reducing the solution; precipitated with subacetate, but not with acetate of lead; by heating with dilute acids dextrose was produced quantitatively. The solution has an insipid taste, and is strongly dextrogyre.—Pharm. Centralh, 1892, 534; Am. Jour. Pharm., 1892, 569.

LINIMENTA.

Rosen's Liniment deposits the oil of nutmeg which it contains, and which is again suspended by agitation as needed. Made with 60 per cent. alcohol the deposit forms but slowly, and when brandy is substituted it floats entirely on top; but such a modification diminishes the rubefacient action. P. Vigier proposes the addition of 1 or 2 Gm. castor oil, but according to Fr. Gay, while this gives good results, the deposit still separates rather quickly. This author (L'Union pharm., March, 1893, p. 137) proposes to emulsionize the oil with tincture of quillaja, as this has no chemical action on the oil and produces the desired effect. The following is his formula: Expressed oil of nutmeg, 5 Gm.; volatile oil of cloves, 5 Gm.; tincture of quillaja, 10 Gm.; spirit of juniper, 80 Gm.—Amer. Jour. Pharm., 1893, 341.

Soap Liniment.—By J. Bienert.—(Pharm. Zeitschr. Russl., 1892, T. 743). To remedy the clouding of this liniment the author proposes to substitute sesame oil in place of olive oil.—Pharm. Central., 1893, 88; Amer. Drug., 1893, 177.

——— G. W. Sloan.—West. Drug., 1893, 63.

Aluminum Acetate Solution.—Glückmann has attempted to explain the spontaneous gelatinization of this solution, and finds, so far, that it is neither due to the alkali nor to the acid.—Zeits. Oest. Apoth. Ver., 1892, 557.

——— M. Rucker gives a method for its preparation which is free from any objections.—Zeits. Oest. Apoth. Ver., 1893, 158.

Boric Acid—Concentrated Solution.—Scholz and Mansier, (Rép. de Pharm.; Merck's Bull.) recommended the addition to the mixture of boric acid and water, before boiling, of 1¼ grams [about 1 scruple] of calcined magnesia for every 10 grams or fraction thereof beyond the normal quantity of 40 grams per liter of water. The calcined magnesia may be replaced by the carbonate of magnesium, according to Ploux, who suggests the preparation of a stable solution—containing 100 grams of boric acid in a liter of solution—as follows:

Boric acid	100 parts.
Magnesium carbonate	11 parts.
Water	1000 parts.

Even a 20 per cent. solution of boric acid can be prepared, thus:

Boric acid	200 parts.
Magnesium carbonate	35 parts.
Water	1000 parts.

——— F. Guiraud in Jour. Pharm. Chem., 1893, 468.

Burrow's Solution.—E. Feller gives a quantitative analysis.—Zeits. Oest. Apoth. Ver., 1892, 455.

Solution of Mercury Sodo-idol.—E. Schwimmern, Pharm. Post, 1892, 723.

Iodoform Solutions—Instability of.—H. Barnouvin in Rép. de Pharm., 1893, 51.

Iron Solution—Modern.—Preparations with formulas issued by the Berlin Apothecary Society.—Pharm. Centralh., 1893, 225–228.

——— E. Dieterich, remarks upon.—Ibid., 1893, 259.

——— Ibid., 276, 290.

Solution of Ferric Acetate.—Behavior of towards Sulphuric Acid.—T. Salzer.—Pharm. Centralh., 1893, 191.

Liquor Ferri Salicylatis.—At a pharmaceutical meeting in Philadelphia, the following formulæ were proposed:

℞	Ferrous sulphate, pure	384 grains.
	Sodium acetate	320 grains.

Dissolve in seven fluidounces of distilled water.

Sodium salicylate	480 grains.

Dissolve in seven fluidounces of distilled water.

Mix the solutions and wash the filter with sufficient distilled water to make fifteen fluidounces; to this add one fluidounce of glycerin.

The following formula for a somewhat similar preparation named mistura sodii salicylatis, was originated by Dr. S. Solis-Cohen, of the Philadelphia Hospital:

Tincture of ferric chloride	2 fl. oz.
Sodium salicylate	2 troy ounces.
Citric acid	40 grains.
Glycerin	4 fl. ozs.
Oil of gaultheria	120 minims.
Liq. ammon. cit. B. P. q. s. ft	1 pint.

In the Am. Jour. Pharm., 1886, p. 534, is republished a formula, taken from Braithwaite's Retrospect, an English journal, based upon the same reaction, but this results in a much weaker preparation. A proprietary article has also been placed upon the market under the same name.—Am. Jour. Pharm., 1893, 247.

Labarraque's Solution—To Determine Alkalinity of, etc.—N. G. Blattner proposes several methods: (1) 25 C.c. are diluted with 50–100 C.c. water, and after adding water of ammonia to excess, the mixture is gradually heated until the reaction has ceased, when the liquid can be boiled to dryness and redissolved in water to make 250 C.c. Of this solution, 100 C.c. (= 10 C.c. original preparation) can be directly titrated with standard sulphuric or hydrochloric acid, using methyl-orange as indicator. By using methyl-orange and phenolphthalein, it is possible to determine separately the alkalinity due to sodium hydrate and sodium carbonate. (2) 10 C.c. of the preparation are diluted with water, a few drops phenolphthalein added and titrated with normal sulphuric acid; it may be necessary to add a drop of phenolphthalein solution from time to time to determine if the alkali has been neutralized, as the first portion may be decolorized through the liberation of small quantities of chlorine before the alkali has been neutralized. (3) 25 C.c. are diluted with water, and a little cobalt or nickel sesquioxide suspended in water added; after gradual heating (to prevent a violent reaction) the mixture is boiled, diluted with water to 250 C.c., and in 100 C.c. (10 C.c. original solution) the sodium hydrate and carbonate are determined as under the first method. All three methods give satisfactory results; No. 2 after some practice is to be preferred, owing to rapidity.—Chem. Ztg., 1892, 885; Am. Jour. Pharm., 1892, 407.

Solution of Lead—New Basic.—The following is intended as a succedaneum for liquor plumbi diacetatis: Solutions of magnesium acetate have

the property of dissolving lead oxide, and in order to prepare a solution containing 4 per cent. of the oxide, we proceed as follows: 184 parts of acetic acid are diluted with water and saturated with carbonate of magnesium, free of chlorides, and enough water is added to make 1,000 parts. After filtration, the density of this solution should be about 1.0377, the solution containing 10 per cent. of magnesium acetate. Seventy parts of oxide of lead is added to the solution, and the whole heated in the water-bath for one hour, and, finally, sufficient water is added to again bring the whole up to 1,000 parts. Let stand for twenty-four hours, and again take the density. A difference of 0.001 is equivalent to 1 per cent. of oxide of lead. If the difference is greater than 0.004, weaken by adding water until the desired strength is obtained. "Eau blanche" (diluted solution of subacete of lead) is made by adding 4 parts of this solution to 96 parts of water.—Rép. de Pharm.; Nat. Drug., 1892, 124.

Solution of Subacetatee of Lead.—Oldberg. A note on the composition. —Apothecary, Aug., 1892.

Goulard's Extract—Substitute for.—The action of magnesium acetate solution upon magnesium oxide in hydrating the latter and causing a considerable portion to dissolve, has been made use of in the manufacture of "sinodor" preparations as deodorizing agents. Magnesium acetate solutions also have the power of dissolving lead oxide, and this is the basis of a patent for the manufacture of "white lead." A solution containing 4 per cent. lead oxide is also offered as a therapeutic agent in which the action of lead oxide is especially desired. It is made as follows: 187 Gm. acetic acid are diluted with water and saturated with magnesium carbonate free from chloride, and water added to make one kilo. After filtering this, the specific gravity should be about 1.0377 and the solution contain 10 per cent. magnesium acetate; it is then heated in a water-bath for one hour with 7 per cent. lead oxide, and by the addition of water the original weight (one kilo) restored; after standing 24 hours the specific gravity is again determined, a difference of 0.001 indicating 1 per cent. lead oxide; if the difference is greater than 0.004 the solution must be correspondingly diluted. From the finished preparation an efficient lead water can be made by the addition of 4 parts to 96 parts water.—Kubel, Archiv der Pharm., 1892, 173.—Am. Jour. Pharm., 1892, 371.

Liquor Magnesii Carbonatis.—George Lunan.—The author finds the commercial product to be of a more uniform nature than heretofore, and urges the addition of glycerine as the only certain means of keeping the fluid near to the Pharmacopœial strength in bottles which have been kept for some time, and which have had more or less of their contents withdrawn. The best solution of the difficulty is also to send out this preparation in syphons supercharged with carbonic acid gas.—Phar. Jour. Trans., 1893, 619.

Citrate of Magnesia—Solution of.—Formulas for, in Pharm. Record, 1892, 462.

Solution of Cocaine—Notes on the Improved.—I. Townsend,—J. Ophth., Otol., and Laryngol., N. Y., 1893, 1522.

Morphine Solutions—Preservation of.—Dissolve one gm. of morphine hydrochlorate in a mixture of 5 Gm. of alcohol and 10 Gm. of glycerin, then add 15 Gm. of distilled water, and filter. According to La Terapia Moderna this solution will keep without alteration for months.—Rép. de Pharm., Feb., 1893, 79; Am. Jour. Pharm., 1893, 229.

Musk.—Solution of, in glycerin for hypodermic injections is easily prepared according to M. Lambotte (Jour. de Pharm. d' Anvers) by mixing the alcoholic tincture of musk with half its volume of glycerin, allowing the alcohol to evaporate and then adding sufficient glycerin to make it equal in volume to the tincture first employed.—Am. Jour. Pharm., 1893, 130.

Physostigmine Solution—Permanent, can be made by dissolving physostigmine in carbonated water, transferring to small tubes, heating to 100° C., (which expels the excess of carbonic dioxide and sterilizes the solution) and hermetically sealing the tubes. The decomposition, according to Sabbatani, is due to the alkalinity of the solution caused by the solution taking up alkali from the glass and becoming red; the presence of the weakest acid, however, prevents this decomposition.—(Riforma med.) Rundschau, 1893, 144; Am. Jour. Pharm., 1893, 171.

Liquor Potassii Arsenitis.—Oldberg recommends the following formula, as resulting in a product containing K_2HAsO_3 and not liable to decomposition:

Arsenous oxide in fine powder, ten grams	10
Solution of potassium hydrate, two hundred and twenty-five grams	225
Compound tincture of lavender, thirty cubic centimeters	30
Distilled water, a sufficient quantity to make one thousand cubic centimeters.	

Mix the solution of potassium hydrate with one hundred (100) cubic centimeters of distilled water, add the arsenous oxide, and boil the mixture until the powder has been completely dissolved. Add enough distilled water to make the product measure nine hundred and seventy (970) cubic centimeters, and then add the compound tincture of lavender. Filter through paper.—Apothecary, Aug., 1892.

——— *New Method of Preparing.*—Menhaus. The potassium carbonate is first dissolved in a small amount of water. The arsenic is added, and dissolves almost instantly. Fifty parts of melissa water and fifteen parts of dilute alcohol are added, and distilled water sufficient to bring the whole up to 100 parts. This makes a solution which is limpid and remains so indefinitely, and never throws down any precipitate.—Nat. Drug., 1892, 22.

——— *Composition of Precipitate in.*—According to W. Bræutigam, the flocculent precipitate forming in Fowler's solution consists of silicic acid. It is introduced into the preparation by the action of the excess of potassium carbonate on the glass vessel in which it is prepared.

To prepare a solution that will not precipitate, he suggests the method recommended by Traub, which consists in treating the arsenous oxide with the required quantity of normal alkali solution, or Luettke's method of neutralizing the excess of potassium carbonate with acetic acid.—Chem. Zeit. (Rep.), 1893, 9.

Stock Solutions for Prescription.—A Suchomel gives the results of some experiments on the means of preparation and preservation of different solutions.—Pharm. Post, 1893, 169, etc.

Hypodermic Solutions—Sterilization of.—D. Marinucci has found large numbers of living germs, some of a harmful nature, in freshly prepared hypodermic solutions of strychnine sulphate, morphine hydrochlorate, atropine sulphate, eserine, etc. Sterilization by heat did not affect the therapeutic value of strychnine and quinine, but partly checked the action of morphine and atropine. Eserine and atropine solutions are said to be best prepared with a solution of corrosive sublimate (1 in 1000), which renders them aseptic without modifying their therapeutic properties. Morphine solution could not be sterilized without injuriously affecting the properties of the alkaloid. It is suggested that all such solutions should be renewed every fourteen days.—Pharm. Jour. Trans., 1893, 685; from Centr. f. Bakt., 12, 282.

——— *and Preservation.*—A contribution from Marpmann's hygienic laboratory in Berlin. Pharm Post, 1892, 645.

Hypodermic Solutions—Preservation of.—T. J. Keenan recommends acetanilid even in small amounts; it is also devoid of any noxious action upon the medicaments.—Nouv. Rem.; Bull. Pharm., 1892, 486.

LOZENGES.

Medicated Chocolate Lozenges—Extemporaneous Process of Preparation.—F. Gay (l' Union Pharm.) proposes the following for a *Calomel Lozenge:*

Chocolate	20 parts.
Calomel	1 part.
Simple syrup sufficient.	

Rasp or scrape up the chocolate, and triturate it to a powder in a porcelain or marble mortar. Add the calomel and continue the trituration until the two substances are thoroughly mixed. Then add the syrup drop by drop, triturating constantly until the mixture ceases to adhere to the mortar and attaches itself to the pestle, and a firm, homogeneous paste is formed. Knead and roll out into a sheet of uniform thickness, and divide into squares, each of which contains the desired proportion of calomel.

Roll each of these squares into a ball with the fingers, and finally flatten into round lozenge or troche shape by pressing it on a plate of glass, porcelain or marble, with a little mold of hemispherical shape, made of tin or any other convenient material.

Troches of Extract of Kola may be made as follows:

Alcoholic extract of kola	1 gm.
Chocolate, powdered as directed	10 gm.
Sugar of milk, powdered	1 gm.
Simple syrup, sufficient.	

Triturate in a mortar the extract with sugar of milk until a powder is formed. Then follow the process above indicated, and divide into 10 pastilles.

Alcoholic or ethereal tinctures may be mixed with the powdered chocolate, the mixture spread out in a thin layer, and left to stand until the solvent is evaporated. Triturate anew, after evaporization, to assure of perfect mixture, and then follow the directions given for pulverulent medicaments.

——— Jamet advises the use of weak alcoholic tinctures of such drugs as are soluble in that menstruum for making the ordinary flavored sugar lozenge into an extemporaneously prepared medicated lozenge, somewhat after the fashion in which homœopathic pilules are made. He, however, places one or more drops of the tincture on each lozenge separately, so that they are all equally medicated.—Jour. de Pharm. et de Chim., 1893, 353.

Ipecacuanha Lozenges.—A formula for making large or small quantities in Nat. Drug., 1893, 209.

MISTURÆ.

Copper Arsenite Mixtures.—Copper arsenite is now being more or less used in diarrhœa, and occasonally it has been ordered in mixture form, instead of the usual pill. In such cases it is advisable to add a few drops of diluted hydrochloric acid, dissolve the arsenical salt, or if the mixture be alkaline the compound will be soluble, Attfield states that it is wholly insoluble in water. Whether dilute HCl affects the chemical character of the arsenite is unstated by Attfield, but even if it does, it would be a most dangerous procedure to dispense the mixture simply holding the salt in suspension.—Am. Jour. Pharm., 1893, 7.

Mist. Glycyrrh. Comp.—The following method of making mistura glycyrrhizæ comp. yields a preparation affording no sediment whatever, as proven by experiments of W. L. Stephen:

R.	Acaciæ pulv.,	℥ ss.
	Ext. glycyrrhizæ pulv.	℥ ss.
	Sacchari pulv.	℥ ss.
	Spts. æth. nit.	f. ℥ ss.
	Vin. antimonii	f. ℥ j.
	Tr. opii camph.	f. ℥ ii.
	Aquæ dest.	f. ℥ xij.

Having mixed well the powders, add 6 fluid ounces of water gradually and rub to a paste. Place this in an evaporating dish and heat until perfectly fluid. Add the sweet spirits of nitre, wine of antimony and paregoric, and enough water to make the required amount. The heat employed destroys molecular aggregation otherwise not affected, and results in better and more perfect diffusion of the solid substances, which gives a product devoid of sediment.—Am. Jour. Pharm., 1892, 563.

Hammond's Mixture (modified).—J. W. England.—The original formula for Hammond's Mixture called for pyrophosphate of iron and diluted phosphoric acid. The meta-form of the acid was usually recommended. Upon suggestion, some two years ago, the physicians of the Insane Department of the Philadelphia Hospital tried the official diluted orthophosphoric acid and phosphate of iron in place of the meta-acid and pyro-salt usually used, with very excellent results; and the mixture, as modified, has been daily employed ever since. The modified formula is:

Strychnine sulphate	2 grains.
Iron phosphate (U. S. P., '80)	300 grains.
Diluted phosphoric acid	5 fluid drachms.
Syrup of ginger	4 fluid ounces.
Syrup of lemon	4 fluid ounces.

Water, a sufficient quantity to make 1 pint.

Mix by dissolving the solids in the water, which should be boiling hot, add the acid, and then the syrups.

Dose—One to two teaspoonfuls.

—Am. Jour. Pharm., 1893, 6. (Also, Oldberg, Apothecary, 1892, 69.)

MUCILAGINES.

Acacia—Mucilage of.—E. D. Oesch recommends the following:

Acacia in small fragments	av. oz. 4
Alcohol	fl. dr. 4
Water, sufficient to make	fl. oz. 9

Wash the acacia with cold water, place in a suitable bottle and add to it the alcohol and 7 fluidounces of water previously mixed together, agitate occasionally until it is dissolved, strain, and keep the product in small vials and in a cool place.—West. Drug., 1892, 38.

Tragacanth—Mucilage of.—A. Raes preserves this mucilage by using the following process: 12 Gm. of powdered tragacanth are mixed with 30

Gm. of alcohol; this mixture is well shaken in a 1,000 C.c. flask with 750 C.c. of water, and finally filled up to the litre mark.—Bull. Soc. roy. de Brux.; Chem. Ztg., 1892, 216.

PASTILLES.

Chocolate Pastilles.—V. J. Pequart recommends chocolate in pastilles for exhibiting disagreeable and difficultly administered medicaments, and gives the following procedure, taking calomel as an instance of insoluble medicaments, and santonin of those which are soluble:

(1) Beat the chocolate in a warm mortar and incorporate the calomel, either alone or mixed with aromatized sugar. Excessive heat will cause partial oxidation, blanching the pastilles and altering the mass; it is, therefore, best to work at a temperature of about 25° C. If the powder to be incorporated is bulky, it might be of advantage to add cacao butter, in the proportion of two parts of the butter to one of powder.

(2) Medicaments which are very soluble are preferably incorporated with the chocolate in solution, taking care, of course, to use a vehicle which is not incompatible with the chocolate. Santonin is soluble in five times its weight of chloroform; this will liquefy the chocolate, but will be largely evaporated during the manipulation; however, the pastilles will retain the taste of chloroform for some days.

Another way would be to dissolve the santonin in ten times its weight of cacao butter, or in five times its weight of castor oil. In this latter case, however, it would be necessary to add some sugar for maintaining the consistence, and also to mask the taste of the castor oil, which is stronger than that of chocolate.

For the division of the pastilles M. Pequart uses two tubes, one inserted in the other, the inner one receiving the mass, while the outer one serves as a water-bath. The mass is forced through the tube by means of a piston, and as it emerges is cut by one or more knives fastened to a beam worked by the crank for driving the piston. It is obvious that by properly regulating these parts, pastilles of a uniform weight, and containing a definite amount of the medicament, may be obtained.—L'Union Pharm., 1893, 7; Am. Jour. Pharm., 1893, 127.

Pastilles—Caustic Medicaments in form of.—This process consists in emulsionizing the caustic medicaments with a hot concentrated solution of gelatin, dividing the gelatin hardened by refrigeration, and enrobing the pastilles thus formed with gelatin free from medicament, thus: Dissolve in a water bath,

Gelatin, best quality	50 Gm.
Distilled water	50 Gm.
Glycerin	5 Gm.

In a hot porcelain mortar emulsionize the melted product with, say,

Creosote	100 Gm.

or with any other form of caustic medicament. The emulsion is very easily made. Pour the still hot material on a slab, and, when sufficiently cooled and hardened, divide the mass into the requisite number of doses and mold into pastilles.

Take the pastilles on the end of a needle and plunge them into a solution of pure gelatin aromatized with a sweet extract, if you wish, which covers the caustic pastille with a neutral envelope.

Pastilles thus prepared are odorless, and easily swallowed, even when they contain a gram of creosote or other analogous substance. They dissolve slowly in the stomach, and, by reason of the emulsionized condition of the medicament, exercise no caustic action.—Jour. Pharm. Chim., 1893, 62.

PILULÆ.

Pill-coating.—The following is M. Fauël's method: The pills are uniformly moistened with a liquid composed of one part of glycerin and two parts of strong alcohol; they are then rolled in a sufficient quantity of impalpable powder, composed of saccharin, 4 p.; gum tragacanth, 2 p., and potato starch, 1 p. Remove the excess of powder by means of a sieve, and repeat the operation. To have the pills white, they are then moistened with glycerin, 1 p.; ether, 2 p., and rolled in a powder composed of equal parts of talc and carbonate of calcium.

The following are the author's formulæ for respectively cacao and gelatin coating: 1. Cacao, 2 p.; saccharin, 2 p.; and gum tragacanth, 1 p. 2. Gelatin, 11 p.; saccharin, 5 p.; distilled water, 24 p.—Pharm. Weekblad, through Jour. de Pharm. d'Anvers, 1893, 56; Am. Jour. Pharm., 1893, 173.

Sugar Coating of Pills.—Klisch recommends moistening the pills with simple syrup and agitating them in a round box with a mixture consisting of starch 20 pts., sugar 20, gum arabic 20, or consisting of 80 of wheaten flour and 20 of sugar, for one minute; repeating this treatment from two to four times.—Rundschau, 1893, 234. (Consult Pharm. Zeit., 1893, 94.)

Pills—Salol-coated.—Salol-coated pills have been recommended like keratin-coated pills when the pills are not intended to dissolve in the stomach, as the salol is only decomposed in the duodenum into phenol and salicylic acid. A solution made of 2 Gm. salol, 0.5 Gm. tannin and 10 Gm. ether has been proposed for this purpose, but A. Suchomel doubts if such a coating is effective, and proposes dipping the pills into melted salol (it melts at 42° C.), contained in a small dish placed upon a water-bath for a few minutes; after taking the pills off the needles, the small apertures are closed by applying a little melted salol with a small brush. The coating hardens almost as soon as taken out of the bath, and the pills have the appearance of being sugar-coated. It is suggested that boli containing extracts of pomegranate or male-fern, koussin, etc., be coated in this manner, since it is much more easily accomplished than keratin-coating; gelatin cap-

sules can also be coated by immersion in the melted salol, one-half being dipped, withdrawn and then the other half dipped.—Phar. Post, 1892, 899; Am. Jour. Pharm., 1892, 519.

Silver Coating of Pills.—A. Ulbrich.—Pharm. Zeit., 1893, 32; Pharm. Post, 1893, 105.

Excipient—A New.—Carles (Bull. de la Soc. de Pharm. de Bordeaux) gives the following process for preparing pills of alterable medicaments, such as potassium permanganate, silver nitrate, gold chloride, the iodides of mercury, etc., which with this excipient do not change in appearance, and preserve the active principle indefinitely: Triturate, kaolin 2; anhydrous sodium sulphate, 1; and water, 1; the mass remains plastic during 6–10 minutes, but after fifteen minutes becomes so hardened that it can be thrown on the floor without danger of breaking. With this mass the medicament in fine powder is incorporated.—Amer. Jour. Pharm., 1893, 337.

Animal Charcoal, as a Pill Excipient, is used by M. E. Voilé (Bull. de la Soc. de Pharm. de Bordeaux, May, 1893, p. 142) as follows:

Creasote Pills.—Place in a porcelain mortar 2 Gm. animal charcoal, add 1 Gm. or sufficient quantity of creasote, beat rapidly, and if the creasote is not entirely absorbed add more animal charcoal (about 0.60 Gm.) in small portions. The mass is now nearly pulverulent, and in order to bind it, it is necessary to add 0.20–0.25 Gm. turpentine; then knead the mass rapidly, and divide into 20 pills.

Croton Oil Pills.—Take of croton oil desired quantity, and of animal charcoal sufficient for 20 pills. For these pills it is unnecessary to use turpentine to bind the mass.

Animal charcoal is also useful as an excipient in pills of a more complicated formula, where for instance 1 Gm. creasote is associated with 1 Gm. each of tannin and iodoform; allow the animal charcoal to absorb the creasote, as in the above directions for creasote pills, then add the tannin and iodoform, mix intimately, and bind the mass with turpentine. The caustic taste of the creasote is considerably lessened by the animal charcoal, so that it is only necessary to roll the pills in magnesia or tolu. By means of animal charcoal the above medicaments can also be administered in the form of cachets; the author gives the following two formulas:

(1) Creasote, 2 Gm.; washed animal charcoal, 5 Gm.; mix intimately and divide into 10 cachets.

(2) Oil of turpentine, 5 Gm.; washed animal charcoal, 10 Gm.; mix intimately and divide into 10 cachets.—Amer. Jour. Pharm., 1893, 337.

Wax and Powd. Althæa in Pills.—Hager disapproves of Carles' reasoning that pills made of wax and containing volatile or non-miscible substances with water, pass through the intestines unaltered. Hager says that a mixture of two parts of wax and one part of a volatile fluid sub-

stance becomes by the temperature of 35° very soft and easily decomposed. He further speaks of some creasote pills, which he had made and preserved in cork-stopped bottles for 15 years, after which time they still had the same weight and gave upon mastication a strong creasote taste. On the other hand, pills prepared with mica panis and gum arabic had lost in two years both the odor and taste of creasote. The stomach temperature is 40° C. (104° F.), that of the body 37.5° C., and the melting point of a mixture of two parts wax and one part of volatile oil about 35° C., which demonstrates clearly that pills made with wax are miscible with the stomach contents when heated to the stomach temperature. If the pills are massed with an absorbent powder, such as althæa, separation of the oil readily ensues in the stomach, and the wax passes on into the intestines, where it becomes digested with other fatty bodies.—Pharm. Centralh., 1892, 403. (See also Proc., 1892, 479.)

Pills—The Storage and Preservation of.—By A. C. Zeig. The employment of appropriate excipients may be a strong preventive of any marked changes taking place in shape, appearance and chemical structure, yet these alone are insufficient to withstand the influence of light, heat and the atmosphere for any considerable length of time. A perfect coating of gelatin, sugar, or tolu, etc., will materially assist in keeping the inclosed mass in its proper state of preservation. The use of amber, instead of flint-glass bottles, for storing pills, is to be preferred should they be exposed to light; while replacing the bottle in a wrapper or cartoon, such as is generally furnished, will accomplish the same object. Among the class of gelatin-coated pills most sensitive to light, the following may be enumerated: Mercury protoiodide, phosphorus, quinine, santonin, silver, calomel.—Pacific Drug., Sept. 15, 1892; Pharm. Jour. Trans., 1892, 326.

Blaud's and Vallet's Mass in Powder Form.—Gonnermann takes the freshly prepared carbonate of iron and dries it in an air bath after intimate mixture with 10 parts sacch. lactis and 5 parts powd. glycyrrh. The fine powder is then rubbed with enough powd. glycyrrh. to make it correspond to 40 parts of the whole weight. It then contains 25 per cent. of iron.—Pharm. Post, 1893, 238.

Creasote Pills.—The following method of procedure is pronounced very satisfactory; it depends upon making first what is called a "creasote emulsion" (50 per cent.) from gelatin, 5.50, distilled water, 12.00, sugar, 2.50, and creasote, 20.00; the emulsion is preserved in tight-fitting glass-stoppered bottles. In making pills, the corresponding quantity of the emulsion is taken and made into a mass by the addition of a little powdered liquorice and althæa. The emulsion should be taken from the bottle with a horn spatula, since iron discolors it; the pill mass, however, can be removed from the mortar with an iron spatula.—J. Norberto, Jr., Pharm. Post, 1892, 817; Am. Jour. Pharm., 1892, 462.

——— W. Finger recommends the use of creasote jelly (strength 50 per cent.) as the best method of administering creasote in pill form. The jelly is made by dissolving 11 parts of gelatine and 4 parts of cane sugar in 24 parts of water, by means of water-bath heat, and then incorporating 40 parts of creasote with constant stirring; the finished product weighing 80 parts (a little water being added if necessary to insure exact weight) is in form of a grayish white soft elastic mass, and can be preserved in glass stoppered wide-mouth bottles. A pill mass can readily be made from the jelly by addition of powdered licorice and marshmallow root.—Pharm. Post., 1892, 817.

——— J. F. Brown recommends the use of infusorial earth otherwise known as kieselguhr.—Chem. and Drug., 1893, 496.

——— M. Limbo (Jour. de Pharm. et de Chim., Oct., 1892) recommends the following process for these pills, by which he obtains a preparation having the odor and taste of the creasote completely masked: The creasote is mixed with about twice its weight of pulverized gum arabic, and when the liquid has been well absorbed a few drops of glycerin are incorporated with the mass.—Am. Jour. Pharm., 1893, 73.

——— Schmidt and Beerfelden recommend either Dieterich's formula or the following: Creasote, 20 grams; glycerine, 4; powd. ext. glycyrrhiza, 25; liquorice root and althæa root, powdered, aa. 12.5; glycerin jelly, q. s., to make 200 pills. Keep in powd. orris root.—Pharm. Centralh., 1892, 400.

——— In Pharm. Post., 1892, 1245.

Creasote, 3 gr.; ext. glycyrrh. depur., 2 gr.; pulv. glycyrrh., 6 gr. Make into 60 pills.

Creasote, 10 gr.; glycerine, 1 gr. Make into a mass with powd. and ext. of glycyrrhiza.

——— Rayman rubs the creasote with soap first, and after allowing it to stand a moment finishes the mass with the requisite amount of powdered liquorice.—Pharm. Post., 1892, 1008.

——— In Apoth. Zeit., two methods are given: 1. Cera flav., 5.0 Gm., are melted with 10.0 Gm. creasote, and the cold mass made into 100 pills with pulv. sapon. 5.0 Gm., and magnes. carb. 10.0 Gm. 2. When the soap and magnes. carb. are not indicated, the wax and creasote, aa. 10.0 Gm., are melted together and then made into a mass with wheat-starch and powd. ext. glycyhrr., aa. 5.0 Gm., and divided into 100 pills.—Zeits. Oest. Apoth. Ver., 1892, 730.

Creasote Pills and Balsam of Tolu.—A similar pill to Upjohn's is now put upon the market by a firm in Breslau, containing about 0.5 or 0.1 Gm. of creasote (and possibly 0.03 Gm. of tolu balsam to moderate the corrosive action of the creasote). These can be crushed to a powder between the

thumbs, and dissolve in from 15 to 20 minutes in water at 37°.—Pharm. Centralh., 1892, 400.

Carbolic Acid in Pills.—Charteris coats the pills with keratin.—The Am. Therap., 1893, 283.

Pills containing Carbolic Acid, Creasote, Essential Oils.—Notes by H. S. Coupland.—Chem. and Drug., 1893, 734.

Creolin Pills.—Creolin is not only used as an external disinfectant, but also an internal remedy in choleriform affections. M. Hofman (Jour. de Pharm. d' Anvers, Nov. 1892) recommends the following formula: Creolin 5 Gm., and kaolin, 15 Gm.; to be divided into 100 pills, and kept in talc. This preparation forms a perfect emulsion with water. The pills may be coated with keratin to prevent the evaporation of the creolin; but salol-coating is preferable, as the salol acts as an intestinal disinfectant.

Volatile Oils in Pills—Note on Dispensing.—A. C. Stark. In Jour. de Pharm., October 1892, appears a note by an Austrian pharmacist, advocating a new method for dispensing creasote in pills. A jelly is first made of the following constituents:

Gelatin	11 parts.
Distilled water	24 parts.
White sugar	5 parts.

These are melted together on the water-bath, and while liquid 40 parts of creasote are gradually added, and the whole well mixed.

The product is a stiff, white, tenacious paste, containing 50 per cent. of creasote. Mixed, in a slightly warmed mortar, with a small quantity (3 parts to 2) of a vegetable powder, it forms a good pill mass. The process seems to be capable of extension to volatile oils, as he prepared several of these gelatinous masses, each containing 50 per cent. of volatile oil. He found these to answer admirably; forming pills from which the volatile oil does not exude, and which are easy to roll. The mass is slightly spongy at first, but becomes quite hard in a day.

The author has used this process in making pills of oil of savin.

These gelatinous masses, impregnated with volatile oil, appear to keep almost indefinitely, while the plain jelly can be kept (when cool) under a layer of rectified spirit for a very long period.—Pharm. Jour. Trans., 1893, 758.

Phosphorus in Pills.—Fourcy makes a homogeneous mixture of the powdered substances ordered in the prescription; next dissolves the phosphorus in carbon bisulphide and incorporates the solution quickly with some soft extract of cinchona; finally adds the powder to the extract. The heat developed in forming the mass causes the volatilization of the bisulphide, and it is stated that in a few minutes the whole process may be satisfactorily completed.—Mon. de la Pharm.; Pharm. Jour. Trans., 1892, 350.

Potassium Iodide Pills.—

1. ℞ Iodide of potassium..... 0.25
Powdered starch..... 0.5
Simple syrup..... q. s.
(M. Van Gool.)

2. ℞ Iodide of potassium..... 4.50
Cacao butter..... 1.00
Neutral petrolatum..... q. s.

3. Take iodide of potassium, prescribed quantity, dissolve in a small quantity of water, add gum arabic in sufficent proportion to obtain an ordinary mucilage, then add potter's clay in sufficient quantity to make a mass of proper consistency; immediately roll into pills, for in a short time the mass becomes hard. The pills can be rolled in potter's clay, or covered after the manner of iodide of iron pills.

Pills thus prepared keep perfectly well even without much care; they dissolve rapidly in water, and give a liquid absolutely colorless after depositing the potter's clay.

4. ℞ Iodide of potassium, in powder..... 2.00
Cacao butter..... 1.00
Medicinal soap..... 1.50
Vaseline..... q. s.
For 20 pills, rolled in talc.

—Pharm. Record, 1893, 253.

Quinine Pills.—The Jour. de Pharm. d'Anvers 1893, 14, gives the following method of preparing these pills: Quinine sulphate, 5 Gm.; powdered acacia 5 Gm.; powdered sugar, 5 Gm.; tartaric acid, 3 Gm.; powdered tragacanth, 2 Gm.; this mixture is made into a mass with 3 drops of pure sulphuric acid and 27 drops of water. Then cut into 200 pills, each containing 0.05 Gm. of quinine sulphate. At first they are rolled with powdered starch, then with powdered talc.—Pharm. Centralh., 1893, 88; Amer. Drug., 1893, 177.

Tannic Acid Pills—Keratin Coated.—A. Suchomel prepares them as follows:

Acidi tannici..... gr. xxx.
Opii pulv..... gr. iij.
Cerae flavæ..... gr. xlv.
Olei amygdalæ dulc..... gtt. v.
Fiant pilulae no. triginta; obducantur keratino.
Sig.—One pill every three hours.

Melt the oil and wax together, add the opium and tannin, and roll out the pills quickly.

After standing half an hour, the pills are ready to be keratinized.

The keratinizing solution is prepared by dissolving seven parts of keratin (pepsino parat.) in one hundred parts of concentrated acetic acid.

To coat the pills they are placed in a large porcelain capsule, four or five drops of the keratin solution added, and then rolled about in the capsule every five or ten minutes for half an hour. Then another addition of a few drops of the solution is made and stirred about as before. This may be repeated once or twice again, when the coating will be found sufficient. —Pharm. Post, 1892, 797.

Pills of Tar—Clay as an Excipient.—Ivanoff in Sem. Méd., May 1893; Rép. de Pharm., 1893, 248.

Wax in Pills.—Bura recommends the use of a stiff mucilage of acacia with the wax.—Pharm, Post., 1892, 704.

PYROXYLIN, ETC.

Pyroxylin—Manufacture of.—The pyroxylin used in pharmacy and the arts, dinitrocellulose, is usually regarded as non-explosive, but C. O. Weber shows how, under certain conditions, it may become dangerous. After preparing some in the usual manner, he added a small quantity of ammonia to the water used for washing, so as to effect complete removal of the acids more rapidly. A copper oven heated to 70° C., used for drying about one ounce of the pyroxylin thus treated, was after three hours' drying torn to pieces by the force of an explosion, the fragments of copper being hurled all over the room. Since pure dinitrocellulose requires a temperature of 194° to 198° for ignition, while hexanitrocellulose only ignites at 160°–170°, it appeared that the explosion must be due to the use of ammonia in the washing process. A little nitrate of ammonia was probably formed and dried upon the nitrocellulose in a state of fine sub-division, and any trace of acid would then suffice to cause the salt to act as a fuse. The use of ammonia in this connection is accordingly to be avoided.—Pharm. Jour. Trans., 1893, 806; from Jour. Soc. Chem. Ind., 12, 117.

Pyroxylin—Note on Denitration of.—D. Woodman prepares sheets of cellulose by reduction in a bath of ammonium sulphide and subsequent washing. The material is slightly hygroscopic, quite strong, elastic, becoming somewhat brittle when very dry, and is translucent or transparent according to the purity of materials used in manufacture and the thickness of the sheet. Sp. gr., 1.545.

One of its most interesting practical applications has been the preparation from it of incandescent electric lamp filaments, its homogeneity of structure, when carefully prepared, rendering it a promising substance for this purpose. As the reducing action will not penetrate beyond a few thousandths of an inch, the process can be successfully operated only on thin sheets of pyroxylin.—Jour. Amer. Chem. Soc., 1892, p. 114; Am. Jour. Pharm., 1892, 481–483.

Gun Cotton—Determination of Ca and Mg.—Schjerning. Weigh out

3 to 5 grams of the cotton, wet with a mixture of equal parts ether and alcohol saturated with paraffin, add one-fourth the volume of water, and introduce a few pieces of paraffin. Ignite the ether vapors, moving the dish about so that the cotton is soaked with the paraffiin. Finally incinerate completely to ash over a strong flame, and weigh total ash (B per cent.). Then heat with a known amount of tenth normal HCl exactly to 90° C. Cool—add a little pure NaCl, and a few drops of litmus solution, and then render perceptibly alkaline with tenth normal soda. Filter off and weigh "impurities" (C per cent.), consisting of Fe_2O_3, Al_2O_3 and SiO_2 and titrate back with tenth normal acid. Representing by A the c.c. of tenth normal acid neutralized by the bases in 100 grams of the cotton.

Per cent. MgO = [A 0.0028—(B—C)] 2.5.
Per cent. CaO = [(B—C)—A 0.002] 3.5.
—Zeitschr. f. analyt. Chem., xxxi, 283.

Silk Nitrated.—By L. Vignon and P. Sisley. The yellow coloration of silk seems to be dependent on the action of nitrous compounds, and subsequently of an oxidizing agent. The properties of nitrated silk somewhat resemble Mulder's xanthoproteic acid, but this contains more carbon and less nitrogen, and results from a more intense action.—Am. Jour. Pharm., 1892, 586–587; Bull. Soc. Chim. [3], 6, 898; Jour. Chem. Soc., September, 1892, p. 1111.

Amyloid—Vegetable.—E. Winterstein regards amyloid as a substance corresponding somewhat with starch or cellulose, but derived from galactose and xylose, instead of from glucose. Whether the substance is really homogeneous is not yet certain, but the fact that the amyloid prepared from the seeds of Pœonia officinalis yields almost the same quantities of mucic acid and furfuraldehyde, is in favor of this supposition.—(Berichte, 25, 1237–1241.) Jour. Chem, Soc., 1892, p. 803; Am. Jour. Pharm., 1892, 483.

RESINÆ.

Resins—Solution of Medicinal.—Harold Wyatt, Jr. The author gives the following process: Three hundred and eighty-four grains of jalapin (insoluble in ether) were mixed with 3 oz. of strong solution of ammonia and allowed to stand, with occasional shaking, for two days. The resulting solution was placed in a water-bath, 2 oz. of glycerin were added, and the whole evaporated, with constant stirring, until ammoniacal fumes were no longer given off, the liquid being made up when cold to 8 fluid oz. with glycerin. On trial in the Liverpool Royal Infirmary, this preparation was found to be both active and reliable. Subsequently he made in a similar way a series of solutions containing respectively resin of scammony, podophyllin and aloin, all of which turned out satisfactorily. Guaiacum resin gave a solution which deposited a good deal on standing; the supernatant liquid, doubtless ammonium guaiacate, was found useful as an

addition to gargles and gelatin throat pastilles. This method is capable of extended application in making liquid preparations of drugs which owe their activity wholly or in part to resins or resinoid bodies—such, for instance, as cascara sagrada and podophyllum.—Chem. and Drug., Oct., 1892; Am. Jour. Pharm., 1892, 633.

SAPONES.

Mercurial Soaps.—The direct saponification of fats and oils by mercuric oxide not being feasible because of the reduction of the oxide to metal, and the precipitation of mercuric chloride solution by soap solution, yielding a product from which the excess of mercuric chloride can only be removed by repeatedly boiling with fresh portions of water, during which separation of metallic mercury also occurs, Mr. C. Micko was compelled to first separate the fatty acids from the fats and oils and then by warming cause these to react with yellow oxide of mercury; the products were entirely satisfactory for medicinal use. The fats were saponified in the usual manner and the fatty acids liberated from the alkali-soaps by adding hydrochloric acid; after boiling the fatty acids with several portions of water to remove mineral acid, they are transferred to a capsule and dried in an air-bath. To determine the necessary mercuric oxide about two grams of the acid are titrated with $\frac{N}{2}$ alkali, using phenolphthalein as indicator (for most purposes the oxide necessary can be calculated if the average molecular weight of the fatty acids is known, this requiring 108 parts mercuric oxide). The acids and oxide are rubbed together; then a little water added and heated carefully on a water-bath until the color of the oxide disappears (if the acids separated from tallow be used, the operation must be completed by finally heating carefully on an oil-bath); to obtain good results excessive heating must be avoided. The following table gives (1) the source, (2) saponification-equivalent, (3) average molecular weight, and (4) iodine absorption of the fatty acids; (5) percentage of HgO, (6) color, and (7) consistence of the resulting soaps.

1.	2.	3.	4.	5.	6.	7.
Sesame-oil	198.0	283.3	110.5	28.26	yellowish	of cold cream
Olive-oil	200.3	280.1	88.5	28.48	yellow	"
Lard	202.0	277.8	65.0	28.69	almost white	firmer
Palm-oil	207.0	271.0	53.4	29.18	orange to brown	"
Beef-suet.	200.0	280.5	38.5	28.45	almost white	of lead plaster
Cocoanut-oil.	276.3	205.3	8.6	35.70	"	waxy
Stearic acid	205.7	272.7	1.7	29.05	"	friable

The consistence of the soaps, also their susceptibility to decomposition by heat, follow the variation in the iodine-absorption of the fatty acids; while the soap made from sesame oil-acids is soft, so that it can be drawn

into threads, it is most easily decomposed by heat; commercial stearic acid yields a soap so hard that it can be powdered and used in this condition. These soaps are much more permanent than the commercial oleates (solution of true oleate in excess of oleic acid); for the preparation of pastes and ointments the soap made from olive oil is most desirable, while for plasters the soaps from beef suet or cocoanut oil, owing to their firmer consistence, are to be preferred. For these purposes it is only necessary to soften the soaps on a water-bath and then incorporate the other ingredients.—Oesterr. Ztschr. f. Pharm., 1892, 354 and 372; Am. Jour. Pharm., 1892, 459.

Water and Free Fatty Matter in Soap.—Determination by J. A. Wilson. —Chem. News, 1892, 200.

Pulverulent Medicinal Soaps.—P. J. Eichhoff recently recommended the use of this class of soaps, because of the ease with which medicinal substances could be incorporated. By boiling soda solution and beef suet together, a neutral soap is produced, which is placed upon the market as a fine anhydrous although hygroscopic powder; this forms the basis for all of the soaps, and is called neutral soap-powder base; by the addition of 2 per cent. oleic acid, and 3 per cent. lanolin, a base is obtained, containing free or excessive fat; by the addition of 2.5 per cent. each of potassium and sodium carbonates an alkaline soap-powder base results. The following preparation may be incorporated with any one of the three bases: 20 per cent. pumice stone; 10 per cent. sulphur, balsam of Peru; chlorinated lime, chrysarobin; 5 per cent. salicylic acid, β-naphthol, camphor, borax, pyrogallol, menthol salol, tannin, thiol, naphthalin; 3 per cent. benzoin, iodoform, iodol; 2 per cent. thymol, iodine, aristol, europhen, quinine sulphate; 0.2 per cent cantharidin. More than one medicinal ingredient may be used, as is indicated by the following: Salicylic acid and resorcin, 5 per cent. each; salicylic acid and sulphur, 5 per cent. each; salicylic acid, resorcin and sulphur, 5 per cent. each; camphor, 2 per cent., and sulphur, 5 per cent.; camphor, 2 per cent., sulphur, 5 per cent., and balsam of Peru, 10 per cent.; β-naphthol and sulphur, 5 per cent. each; mercuric chloride, 2 per cent., and sodium chloride, 1 per cent.—(Therap. Monatsch.) Pharm. Ztg., 1892, 736; Am. Jour. Pharm., 1893, 68.

——— Therap. Monatsch., 1892, 581.

Quillaja Soap.—Bloch has obtained a German patent in which he claims that he mixes the quillaja extract, after removing the resinous material, with a potash or soda soap.—Rund., 1893, 235.

Soaps—Healing.—M. Hobein.—Pharm. Post, 1892, 789.

——— *By Cold Process.—Pure Almond Oil Soap.*—Saponify the sweet almond oil with a weak lye and then separate out with a salt solution of 20° B. Of the oil thus purified take 100 parts and add, stirring briskly, 34 parts of soda-lye and 17 parts of potash lye of 38° B., at a

temperature of 25° C. Prepare the raw soap mixture in the morning, stir energetically for an hour, then leave to settle, stirring for a few minutes every hour. Leave the container overnight in the warm room, and again beat up briskly next morning. The soap will then soon begin to thicken, and may be poured out into the forms. Saponification continues after a further lapse of 48 hours, but the mass should be kept warm and hardens after a period of from 36 to 48 hours. For cosmetic preparations, such as Pomade Hongroise, this almond oil soap forms a complete substitute for Castile soap. In equal parts of distilled water it dissolves as a beautiful transparent mucilage. As a toilet soap it is most agreeable to the skin.

ALMOND OIL AS AN ADDITION TO COCOANUT OIL.

Three parts of cocoanut oil and one part of sweet almond oil, saponified with a soda-lye of 38° B., produce an excellent almond-cocoanut soap, lathering smoothly, and acting very pleasantly upon the skin. In washing, the soap shows the characteristics of a good fat soap, viz., smoothness and slight frothiness.

ALMOND OIL SHAVING-SOAP BY THE COLD PROCESS.

Saponify 85 parts of tallow and 15 parts of sweet almond oil at a temperature of 45 to 46° C., with 25 parts of soda-lye and 25 parts of potash-lye (without cocoanut oil).

Saponification takes place early. The soap produced gives a brilliant creamy lather, possesses a beautiful white color, and the bars do not shrink, but preserve their straight edges. The soap cuts beautifully.—Amer. Drug. and Pharm. Record, 1893, 339; adapted from Schimmel's Ber.

SPIRITUS.

Ethyl Nitrite and Spirit of Nitrous Ether—A Process for.—E. L. Patch. The theory depends upon the action of nascent nitrous acid upon alcohol, the HNO_2 being liberated by acting upon sodium nitrite with sulphuric acid:

The following table shows results obtained and cost to the operator.

Ninety-six per cent. sodium nitrite being used, the possible theoretical yield from 500 grams would be 521 grams $C_2H_5NO_2$ absolute ethyl nitrite (sp. gr. 0.900 according to Dunstan and Dymond).

Distillate.	Washed nitrous ether.	Per cent. of theoretical yield.	Cost per lb. ethyl nitrite.	Cost per lb. 90 per cent. ether.	Cost per lb. 4½ per cent. spirit.
1. 340 G.	160 G.	30.7	$5.25	$4.73	.60
2. 220 G.	160 G.	30.7	5.25	4.73	.60
3. 370 G.	190 G.	36.4	4.42	3.98	.57
4. 400 C.c.	270 G.	51.8	3.11	2.80	.51
5. 500 C.c.	425 G.	81.5	1.98	1.77	.46½
6. 450 C.c.	347 G.	66.6	2.42	2.18	.48
7. 460 C.c.	386 G.	74.0	2.18	1.96	.47
8. 430 C.c.	300 C.	57.5	2.80	2.52	.50

The cost was estimated as follows:

500 grams sodium nitrate @ $0.35 lb.	$0 39
550 C.c. alcohol @ $2.65 gal.	40
220 C.c. (406+ grams) sulph. acid C. P. @ 15c. lb.	13
60 grams sodium carbonate in 2,000 g. water 30 grams dried potassium carbonate	01
Time, 3 hours	75
	$1 68
Interest, waste, etc., 10 per cent.	17
	$1 85

The cost of 4½ per cent. spirit of nitrous ether was estimated as follows:

No. 1. 1 lb. 90 per cent. nitrous ether	$4 73
10 lb. cologne spirit (6.78 lb. to gallon) 2.8 gal.	7 42
20 lb. @ 60c. lb.	$12 15

NOTES ON PROCESS AND CHANGES SUGGESTED.

(1) Sodium nitrite, 96 to 98 per cent. (2) Sulphuric acid, titrating 95 to 96 per cent., 220 C.c., or 1,200 C.c. of 28 per cent. (3) Alcohol of 94 per cent. volume strength, sp. gr. 0.820. (4) Product about 600 grams. The ether commences distilling soon after adding a portion of the acid, and after the reaction is over very little heat is necessary to drive over all the ether. (5) Wash with an equal volume of ice-cold distilled water in a tubulated bottle. (6) Wash with equal volume of 5 per cent. solution of carbonate of sodium in distilled water, at a temperature below 5° C. (7) Shake with one-twentieth its weight of dried potassium carbonate. (8) Filter through a pellet of absorbent cotton in a covered funnel. (9) Wash out contents of retort with warm water as soon as the reaction is over, that the sodium sulphate may not crystallize and cause more trouble in removing.

APPARATUS.

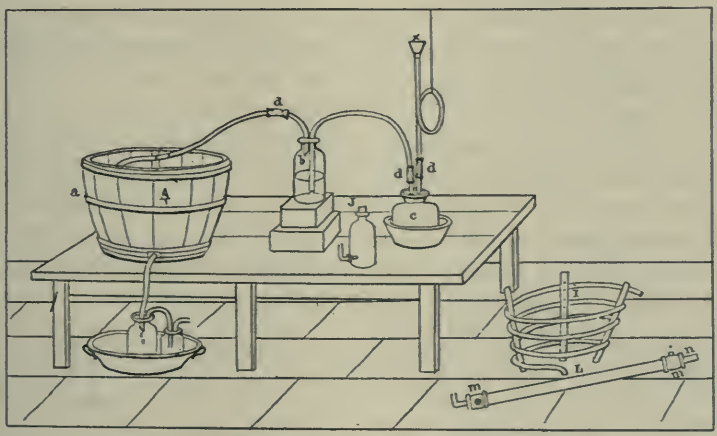
The lack of facilities in many pharmacies for doing any work of this kind leads us to suggest the apparatus shown in the drawing, which can be constructed by any one at little expense. *A* is a portion of an alcohol barrel containing 20 feet of block-tin pipe of half inch internal diameter, coiled, and kept in position by wiring to three strips of wood, as seen in *I*. Ice water may be used for cooling such volatile bodies as we have under consideration.

The outlet of the condenser passes through a cork in the bottle *g*, which is connected with the safety bottle *h*, by a piece of block-tin pipe which

dips beneath the surface of alcohol. (If we follow experiment No. 9, alcohol is also placed in *g*.) As soon as the reaction ceases or the distillation slackens the bottle *h* is disconnected at *d*, where it joins the outlet of *g*, so that the contents of *h* will not be drawn back into *g*.

g and *h* are placed in a tub or pan to permit their being cooled with ice water, and a cloth wet with ice water is thrown over the tops of both *g* and *h*, keeping the connecting tubes cold.

FIG. 56.



Apparatus for Manufacturing Ethyl Nitrite, etc.

b is a two-gallon wide-mouthed bottle, one-third to half full with 5 per cent. sodic carbonate solution through which the ether is allowed to bubble.

At ordinary room temperature the ether will not remain in *b*, while the alcohol and acid will.

In the event of the temperature permitting any ether condensing here at *b*, it is driven forward by placing *b* in a pan of luke-warm water. *C* is a 28-pound chloral jar, fitted with a cork, through which passes a glass tube reaching nearly to the bottom of the jar, and connected with the block-tin funnel tube *f e* at *d*, and provided with a glass outlet tube, of at least half an inch internal diameter, connected with *b* by a block-tin pipe. These fittings of *C* and *b* are made perfectly tight by a luting of cement of litharge and glycerin. If the jar *c* is disconnected at *d d* as soon as the process is completed, it can be rinsed with a little warm water, and its fittings not disturbed. The connections *d d d* may be made with bladder or heavy rubber tubing if the ends of the pipes are brought tightly together. If the jar is not promptly cleaned out, the sodium sulphate may crystallize and give more trouble. Instead of the condenser *A*, *L* may be used.

It is constructed of a piece of 2½-inch gas pipe eight inches long, having a 2½ by ½ inch tee at each end. Through it passes a glass or block-tin pipe N, secured by rubber stoppers or by brass stuffing boxes at each end. By connecting the nipple in one tee with a supply of cold water, and the other with an overflow pipe, condensation is effected. For washing the ether, a gallon bottle, *F*, is tubulated by drilling a hole at *K* with a broken three-cornered file, and finishing it with a smooth rat-tail file, the work being facilitated by wetting the files with water or using a solution of camphor in oil of turpentine.

This tubulure is closed by a smooth cork, through which passes a glass or block-tin pipe, closed at one end and having an aperture cut in the side. When this aperture is drawn into the cork the valve is closed.

Each of the experiments was upon a scale practical for the retail pharmacist. With large apparatus, and working large quantities, the cost may be reduced, but the spirit cannot be prepared of this standard at a cost to satisfy any pharmacist or physician who may still feel that competition demands the supplying of the commercial product containing but 70 per cent. of alcohol of low grade, less than 1 per cent. of nitrous ether, and an excess of acid and aldehyde.—Amer. Drug., 1893, 171.

Spirit of Nitrous Ether, Commercial.—J. E. Seebold examined twelve commercial samples obtained from jobbers and retailers in different localities. The results were as follows: No. 1 contained 0.75 per cent. ethyl nitrite, No. 2=1.3 per cent., No. 3=2.75 per cent., No. 4=3.75 per cent., No. 5=3.25 per cent., No. 6=0.38 per cent., No. 7=2.5 per cent., No. 8=4.65 per cent., No. 9=4.5 per cent., No. 10=3.4 per cent., No. 11=1.0 per cent., No. 12=0.50 per cent., which prove clearly that the pharmacopœial directions to keep the spirit of nitre in small glass-stoppered bottles in a cool, dark place are more honored in the breach than in observance.—Pharm. Review, 1893, 3.

Spiritus Ætheris Nitrosi—A Method of Preserving.—A. Meldrum. With the object of ascertaining the effects of light and heat on the composition of the spirit, and whether the addition of glycerin would have any influence, beneficial or otherwise, on the chemical changes which took place during the storage of it, the writer had made a number of experiments. A strong spirit of nitrous ether was made by the pharmacopœial process. One part of it was diluted with rectified spirit, as directed in the Pharmacopœia; a second part with rectified spirit and glycerin, so that the finished product contained 5 per cent. by volume of glycerin; and a third part with rectified spirit and glycerin, so that the finished product contained 10 per cent. of the latter. The various samples were exposed to different temperatures and degrees of light for a month, and then examined for NO gas by Allen's process, for aldehyde by Thresh's method, for free nitrous acid, for free acetic acid, and for total free acidity—the last three having been examined by the method described by Mr. Peter

MacEwan, but substituting alcoholic for aqueous solution of soda. To eliminate the influence of light when the effect of temperature was registered, three sets of samples were kept in the dark, one at a temperature averaging 35° F., another at temperature 55° to 60°, and a third at from 70° to 75°. To eliminate the influence of temperature when the results of exposure to light were wanted, one set was kept in the dark, a second was exposed to diffuse daylight, and a third to direct daylight, the temperature in every case having been the same, viz: from 55° to 60°. The results, which were detailed in tabulated form, showed that the effect of increased temperature tended to cause, first, loss of ethyl nitrite; second, slight diminution of the aldehyde; third, increase of free nitrous acid; fourth, increase of acetic acid; and, fifth, consequent increase of total free acidity. Five per cent. of glycerin tended to diminish the loss of ethyl nitrite, and retarded the formation of aldehyde and free acids, while the addition of 10 per cent. prevented, in great measure, the loss of ethyl nitrite, retarded the formation of acetic acid and total acidity, and reduced the percentage of aldehyde and nitrous acid as temperature increased. The effect of light was to cause loss of ethyl nitrite, and increase of nitrous acid, free acetic acid, and total acidity. The addition of glycerin had results similar to those attending its use in temperature tests. On the whole, the writer stated, the addition of glycerin, at least in a proportion of 10 per cent. by volume, is favorable to the keeping of the spirit without entailing much trouble. The solution of pure ethyl nitrite in absolute alcohol, although not liable to alteration, does not seem to have come into general use—possibly on account of the price, or, as suggested by Professor Leech, on account of the large proportion of alcohol it contained, which might be undesirable in some cases. On the other hand, the addition of glycerin to sweet spirit of nitre, while tending to preserve it, would not alter its characteristic taste or smell to any appreciable extent, and, if adopted, it might obviate the necessity of introducing the more expensive solution of ethyl nitrite in glycerin and the absolute alcohol. Experiments had also been made to show the effect of stoppering, and the results of badly-fitting stoppers were loss of ethyl nitrite, loss of aldehyde, increase of free nitrous acid, and decrease of acetic acid and total acidity. —Chem. and Drug., Feb. 18, 1893; Phar. Jour. Trans., 1893, 697 and 699. (Also 764.)

Ammoniated Essence of Lavender for Smelling Bottles.—The Revue de Thérapeutique, 1892, 418, publishes the following formula to be used in smelling bottles with pieces of ammonium carbonate: Alcohol, 250 C.c.; oil of lavender, 10 C.c.; oil of bergamot, 12 C.c.; oil of cloves, 5 C.c.; oil of cinnamon, 5 C.c.; oil rose, 1 C.c.; tincture of musk, 10 C.c.; concentrated ammonia, 250 C.c.—Am. Jour. Pharm., 1892, 518.

SUPPOSITORIA.

Suppositories with Gelatin.—E. Lücker—Pharm. Ztg., 1892, 430.

Glycerin Suppositories.—A. Thumann states that when these were first prescribed, they were intended to be made of glycerin and cacao-butter, but owing to the belief of some pharmacists that the two were not miscible, the numerous recipes followed in which soap, gelatin and other substances were incorporated. For a number of years he has made a desirable product which melts at the temperature of the body and keeps without change. The cacao-butter is melted at 32°–35° and agitated in a prescription vial with an equal weight of glycerin also warmed until the mixture begins to solidify when it is poured into paper moulds.—Journal der Pharm. v. Elsass-Lothringen, 1892, 121; Am. Jour. Pharm., 1893, 368.

——— J. W. England.—The best method of preserving these from the decomposing action of the air is to enclose them, separately, in small, wide-mouthed, dry vials; tightly cork, dip cork and top of bottle into melted paraffin, and cool, when the contents will be perfectly sealed. The formula of Prof. Remington (See Proc. 1892, 267), gives very good satisfaction. The practice of wrapping glycerin suppositories in paraffin paper or tin foil is objectionable, mainly for the reason that ignorance may lead the user to insert suppository, wrapper and all.—Am. Jour. Pharm., 1893, 6.

Medicated.—Successful clinical experiments by Dr. Kohlstock in rectal applications of aloin, colocynthin and citrullin (colocynthidin), suggested a combination of these cathartics with the popular glycerin suppositories. These are made containing in each suppository either 0.5 Gm. aloin, 0.03 Gm. colocynthin, or 0.02 Gm. citrullin; of these the suppositories containing aloin are used in mild cases of constipation, those containing colocynthin in more serious cases, whilst those containing citrullin are recommended in case of failure of the others. Their action is stated to be reliable; prolonged use may require a small increase in the dose in order to maintain effectiveness.—Pharm. Post, 1893, 104; Am. Jour. Pharm., 1893, 225.

——— *Romer's Formula.*—Bull. Pharm., 1892, 661. Anhydrous carbonate of sodium, 1 gram; powdered (rasped) stearine, 2 grams; add alcohol, 15 grams, and heat in a water-bath until the alcohol is evaporated; then add glycerin, q. s. to make 60 grams. Heat again in a water-bath, and pour into moulds.

Coco Butter for Suppositories is highly recommended by Giesecke (Phar. Zeit.) as a superior substitute for cacao butter as a base for suppositories, this fat congealing much more rapiply while having the same melting point. Coco butter further readily combines with 50 per cent. glycerin, thus being excellently adapted for making glycerin suppositories. —West. Drug., 1892, 300.

Suppository Mould.—A New.—An ingenious mould, by means of which suppositories can be quickly made in the cold, is described by M. Gautier. It consists of a truncated metallic cone divided longitudinally into two parts, which fit accurately together by grooved surfaces. This cone is bored cylindrically for some distance, the diameter of the hole corresponding at this part with that of the wider end of a suppository, whilst at the upper end of it there is a female screw. Lower down, it gradually tapers to a point, thus assuming the exact shape of a conical suppository. In use the two parts of the cone are kept in position by an outer jacket of metal which slips over them. The medicament having been well mixed with the previously grated cacao butter, the exact weight of the mass required in a suppository is introduced into the cylindro-conical opening through a small funnel. By means of a piston, which exactly fits the cylindrical part, and is constructed with a milled head and screw at the upper end, pressure is then applied and the finished suppository may be released at once. As will be readily seen, every one can be made the same in weight and form as the rest, and they are said to be very compact, whilst presenting a brilliant surface. Hollow suppositories for the reception of liquids may be prepared in the same apparatus by introducing 2.7 grams of cacao butter previously rubbed up in a mortar, then pressing into shape with a piston having a conical point, which thus forms a cavity capable of containing 1.2 C.c. of liquid. After filling with the medicament, the suppositories may be closed by small buttons of cacao butter, which are warmed slightly before application.—Pharm. Jour. Trans., 1893, 687; from Monit. de la Pharm., 43, 1213.

SYRUPI.

Syrups—Determination of Water in.—Josse, in Bull. Ass. Chim., 1893, 656; Chem. Zeit., 1893, (Rep.) 102.

Syrups Prepared in the Cold.—It is not a rare occurrence to note in fruit syrups that have been kept for awhile the separation and deposition of a very considerable quantity of sugar. It is a known fact that beet-root sugar when used for syrup becomes in a large degree inverted, a phenomenon brought about by the presence of free acids. According to Kulisch this separated sugar is, in fact, pure dextrose or grape sugar, and the quantity and rapidity with which it forms is in direct proportion to the length of time in which the heating is continued in preparing the syrup, and also to the amount of free vegetable acids present in the latter. As grape sugar is much less soluble than cane sugar (for which latter the syrup formula was originally made), a separation and precipitation must occur. To prevent this separation Kulisch recommends the shortening of the period of heating to the lowest possible extent, and to take the greatest pains in clearing the fruit juices before using in the syrup. He adds that syrups containing this separated sugar may be made to redissolve it

by heating just before they are to be used. Of course, the deposit occurs again as soon as the syrup cools. Such syrups may be utilized in making fresh syrup by warming them and adding them to the fresh preparation in quantity not greater than from 10 to 20 per cent. of the latter.—Nat. Drug., 1893, 90; from Apoth. Zeit.

——— P. Carles reviews the subject of making syrups, and refers to the inconveniences presented by the proposed employment of unrefined crystallized sugars for making syrups, because they possess the flavor of the cane, and always contain saccharate of lime.—Nat. Drug., 1893, 83; Bull. Soc. Pharm. de Brux., 1891, 365; Pharm. Post, 1893, 58.

Syrup Percolator and Reservoir is described by C. B. Lowe in P. C. P. Alumni Rep.; West. Drug., 1893, 63.

Syrup of Hydriodic Acid.—A review of its pharmacy, pharmacology and therapeutics.—Notes on New Rem., 1892, 22.

Syrup of Creasote.—Bull. Pharm., 1892, 603:

Creasote	1 part.
Brandy	50 parts.
Syrup	300 parts.
Peppermint	2 parts.

Syrup of Lactophosphate of Calcium.—A. Christiaens criticises the formula published in Jour. Pharm. Chim., 1893, Nov. 15.—Ibid., 1893, 52.

Easton's Syrup, B. P. C.—The Cause of Crystallization in.—William Lyon has worked out this subject in an elaborate and very practical way. The points to be deduced from his experiments are:

1. That whether the sugar does or does not cause crystallization, a large excess of acid undoubtedly does.

2. That by reducing the percentage of free acid, there is a corresponding reduction in the tendency of the syrup to crystallize.

3. That by using a syrup of phosphate of iron containing 6.25 per cent. of free acid, an Easton's syrup can be made that will keep at ordinary temperatures for a reasonable length of time without depositing, undergoing discoloration or crystallizing.

4. That the quinine phosphate which gives the best results, and which is recommended for making Easton's syrup, is the English No. 1, having the formula $(C_{20}H_{24}N_2O_2)_3.2H_3PO_4.6H_2O$.

SYRUP OF PHOSPHATE OF IRON.

Take of

Pure iron wire (polished)	360 grains.
Concentrated phosphoric acid (sp. gr. 1.5)	6 fluid ounces and 463 minims.
Distilled water	4 fluid ounces.

Place in a flask, the mouth of which is plugged with cotton wool, and

put in a warm place until dissolved, then filter into 72 fluid ounces of syrup (cold) and add sufficient distilled water to make the final product 96 fluid ounces.

SYRUP OF PHOSPHATE OF IRON WITH QUININE AND STRYCHNINE.

Take of

Strychnine	5 grains.
Phosphate of quinine ($(C_{20}H_{24}N_2O_2)_3 2H_3PO_4 6H_2O$)	120 grains.
Concentrated phosphoric acid (sp. gr. 1.5)	75 minims.
Distilled water	225 minims.

Dissolve and add:

Syrup of phosphate of iron to produce 20 fluid ounces.

—Phar. Jour. Trans., 1893, 795.

——— *Note on.*—William Martindale.—Phar. Jour. Trans., 1893, 797.

Syrup of Iodide of Iron, if made from sugar containing ultramarine, will uniformly assume the red color which has so frequently been commented upon; this coloration was never observed when rock candy was used in the preparation of the syrup.—J. Martenson (Pharm. Ztsch. f. Russl,), 1893, 100; Am. Jour. Pharm., 1893, 220.

——— according to A. Bernick, is a delicate reagent for ammonia, the color being changed to yellow or brown; this color is destroyed by boiling or by the addition of citric acid. It is thought that this is the explanation of the change in color that the syrup sometimes shows; at the same time the remedy suggests itself, either to boil such a syrup, or to add a little citric acid.—Pharm. Ztg., 1892, 373; Am. Jour. Pharm., 1892, 408. (Also Phar. Centralh., 1892, 429.)

——— is claimed by Scheerer to remain unchanged if pure white rock candy is used in its preparation, and if absorbent cotton, covered with a layer of glass wool, is used as a filtering medium.—Zeits. Oest. Apoth. Ver., 1892, 312.

Syrupus Granati Corticis.—100 Gm. of the finely powdered bark are boiled for one hour with dilute alcohol, sp. gr. 0.892, using a reflux condenser; after cooling, the drug is exhausted with dilute alcohol, and the percolate, after the addition of 60 Gm. sugar, is evaporated on a water-bath to 100 Gm. Alkaloidal assays of this preparation freshly made and after the expiration of two years gave almost identical results. The precipitate produced upon standing contained no alkaloid, but appeared to consist almost entirely of tannin. Owing to the deterioration of the dried bark and the stability of the syrup, it is suggested that the syrup be made in such places as abound in the production of the drug. The presence of 23 per cent. tannin in the bark imparts to the syrup an unpleasant, astringent taste. Endeavors to manufacture a more palatable preparation led to the following formula: The powdered bark is digested with the necessary quantity of water for twelve hours in a water-bath; after cooling, 50 per

cent. slaked lime is incorporated, allowed to stand again for twelve hours, mixed with 4 or 5 volumes of alcohol sp. gr. 0.830, strained and expressed. The percolate is slightly acidified with dilute sulphuric acid, filtered and distilled; there remains an almost pure solution of the alkaloidal sulphates, in which the alkaloids are determined, and the preparation is finished by adding sugar and a small quantity of the syrup according to the first formula, through which sufficient tannin is introduced to form the more reliable tannate of the alkaloids. Of a syrup containing one per cent. of the alkaloidal sulphates, thirty grams constitute a dose, best administered in an emulsion of thirty Gm. castor oil. The alkaloids are determined as follows: The solution of the sulphates, freed from alcohol, is mixed with a slight excess of milk of lime; after an hour 300 c.c. petroleum ether (boiling point 45° C.,) are thoroughly agitated with the mixture, allowed to stand, and the petroleum ether removed as completely as possible, mixed with 50 C.c. $\frac{n}{10}$ sulphuric acid, the solvent recoved by distillation, used again in the extraction of alkaloid, etc., until the alkaloids have been completely extracted; after the removal of the solvent the excess of acid is titrated with $\frac{n}{10}$ potassium hydrate. Each C.c. of the $\frac{n}{10}$ sulphuric acid neutralized by the alkaloids corresponds to 0.02 Gm. alkaloidal sulphate. The alkaloids in the syrup can only be estimated after precipitating the sugar with an excess of alcohol.—E. Aweng, Jour. der Pharm. Els.-Lothr., 1892, 209; Am. Jour. Pharm., 1892, 563.

Syrup of Hydriodic Acid and Its Uses.—R. W. Wilcox.—Post. Grad., N. Y., 1893, 50.

Syrup of Glycyrrhiza made from the root must vary in quality as the root contains more or less of glycyrrhizin. O. Linde proposes to first isolate the acid ammonium glycyrrhizin and use this in the preparation of the syrup. The cut root is extracted with cold water, the liquid boiled, filtered, concentrated, precipitated with an excess of dilute sulphuric acid, the precipitate washed, dissolved in the least possible quantity of ammonia water and the solution evaporated upon plates at a moderate temperature. Prepared by this method the ammoniated glycyrrhizin will conform to the following tests: (1) Heated with solution of potassium hydrate it evolves ammonia. (2) 0.1 Gm. must be completely soluble in 10 Gm. cold water, forming a clear, pale-brown solution having a faint acid reaction. (3) This solution with 3 Gm. dilute acetic acid yields a precipitate, coagulating by stirring, and an almost colorless filtrate, which should be free from mineral acids. (4) 1 gm. dissolved in 2 C.c. water of ammonia and 4 C.c. alcohol with 15 C.c. absolute alcohol, forms a very turbid mixture. (5) 0.1 Gm. must dissolve in 3 Gm. glacial acetic acid with pale-brown color; the addition of 20 C.c. water causes a coagulable precipitate, whilst the filtrate is almost colorless.

If the above extraction be made with a dilute ammonia water, a better

yield, although of inferior quality, can be obtained, the ammonia extracting bitter and resinous principles which afterwards are removed with great difficulty.

To make the syrup, 4 parts ammoniated glycyrrhizin are dissolved in a mixture of 4 parts alcohol and 26 parts water and added to 166 parts simple syrup.—Pharm. Centralh., 1892, 531; Am. Jour. Pharm., 1892, 565.

Hypophosphite Preparations—Examination of Commercial.—Mr. F. X. Moerk gives as a result of an examination of the more soluble hypophosphite preparations as found in the Philadelphia market, the following tabular statement:

Number of Sample.	Specific gravity at 25° C. compared with H_2O at 25° C.	Hypophosphorous acid; grains per fluid ounce.		Basic constituents present. Q = Quinine. S = Strychnine.
		Found.	Calculated from formula.	
1.....	1.109	0.366	—	K, Na, Ca, Fe, Mn, Q, S.
2.....	1.299	2.232	—	K, Ca, Fe, Mn, Q, S.
3.....	1.284	1.615	—	Same.
4.....	1.286	1.207	—	Same.
5.....	1.291	26.175	26.520	K, Na, Ca.
6.....	1.285	24.313	24.764	Same.
7.....	1.285	24.564	24.764	Same.
8.....	1.278	24.710	24.764	Same.
9.....	1.225	31.478	at least	K, Na, Ca, Fe.
10.....	1.225	31.071	29.709	Same.
11.....	1.321	22.020	23.988	K, Na, Ca, Fe, Mn, Q, S.
12.....	1.337	7.695	—	Na, Ca.
13.....	1.308	12.618	14.210	Na, Ca.
14.....	1.293	2.893	3.518	K, Ca, Fe, Mn, Q, S.
15.....	1.290	11.792	10.584	K, Na, Ca, Fe, Mn, Q, S.
16.....	1.335	19.461	27.462	K. Na, Ca.
17.....	1.297	4.184	9.935	Na, Fe, Mn, Q, S.

Of the several methods for the estimation of hypophosphites, the one with mercuric chloride only was available.

1 is a preparation extensively advertised as a "tasteless preparation of cod liver oil and the hypophosphites." 2 is proprietary, and has been "made" such a success that numerous imitations are being offered to the trade; of these imitations 3 and 4 are examples. The samples so far (1–4 inclusive) probably owe more of their medicinal effect eftect to the alkaloids than to the small quantity of hypophosphites; 5, 6, 7 and 8 are samples of the official syrup of the hypophosphites: 5 containing free H_3PO_2 in place of citric acid, 6 strictly U. S. P.—both of these were made by Mr. Moerk; 7 (recently made) and 8 (in stock for at least two years, during which time it had been repeatedly exposed in a partly filled bottle to direct sunlight) were obtained from a wholesale house—these samples

show no difference in quantity of hypophosphite, although 8 was very much darker in color.

9 (old) and 10 (new) are syrup of the hypophosphites with iron; they are not made according to the U. S. P., but start with ferric hypophosphite and retain this in solution by the addition of some free hypophosphorous acid. 11 is a syrup hypophosp. comp. of the National Formulary.

12 to 17, inclusive, illustrate the great army of special preparations placed upon the drug-store shelves through the conversion of the practitioners by free samples, etc. As the results show, there are a number of these preparations which excite suspicion that they never contained the quantity of salts which the labels state to be present.

It is hoped that the results obtained in the investigation can be used by pharmacists in convincing the physicians of their acquaintance who are addicted to this weakness, that there are preparations which can be made by the authority of Pharmacopœia and National Formulary containing as much of the remedial agents in an ounce as some of their favored specialties contain in a pint.—Am. Jour. Pharm., 1892, 393–396.

——— Formulæ for the following: Syr. hypophos. comp. with iron, manganese and strychnine; hematic hypophosphites; syr. hypophos. with iron, quinine, manganese and strychnine.—Amer. Drug., 1893, 324.

Syr. Hypophos. Comp. with Iron, Quinine and Strychnine.—The following base syrup was made containing no iron as being very satisfactory and used as follows in the preparation of the syrup hypophos. comp. with iron, etc.

Sodium hypophosphite	256 grains.
Calcium hypophosphite	128 grains.
Potassium hypophosphite	128 grains.
Manganese hypophosphite	16 grains.
Quinine alkaloid	16 grains.
Strychnine alkaloid	1 grain.
Hypophosphorous acid 50 per cent.	2 drams.
Distilled water	7 ozs.
Sugar, granulated	13 ozs.

Dissolve the hypophosphites in 6½ oz. hot water, then dissolve quinine and strychnine in ½ oz. water and 2 drams of hypophos. acid, and add to hypophosphite solution, filter, add water to make 7 oz. Dissolve sugar in same by cold percolation and make up to 14 oz. with simple syrup. Then dissolve 240 grs. sulph. iron (clear and bright) in 2 oz. distilled water and 1 dr. U. S. P. phosphoric acid. Then rub 163 grs. calcium hypophos. to fine powder and add the sol. iron and triturate for 2 or 3 minutes; then filter, adding water through filter to make 2 oz. Mix this immediately with 6 oz. simple syrup. This makes a syr. containing 20 grs. hypophos. iron to the ounce. The iron is present in the ferrous form. Mix 2 oz. of this syrup with 14 oz. of above syrup of hypophosphites; this

gives 16 oz of a finished syrup containing 40 grs. hypophos. iron in a pint. This syrup keeps well and seems in all respects to be an excellent syrup.

A precipitate consisting of calcium phosphate and some iron, was produced on the addition of sol. of ferrous hypophos. directly to the syr. hypophos. comp.

In other experiments, the iron was combined as follows:

Sulph. iron	240 grains.
Hypophos. calcium	163 grains.
Distilled water	2 ozs.

The iron was dissolved in the water and the calcium rubbed to fine powder in mortar, and iron added, and triturated for about two minutes. This was filtered, and water added through filter to make up to 2 ozs.; in this 40 grs. citrate potassium was dissolved, and the whole refiltered and made up to 8 ozs. with simple syrup. From these experiments the following deductions were made:

1. That light had a deleterious effect on these syrups.

2. That while 10 grs. citrate potassium would not prevent precipitation, the addition of 20, 30, and 40 grs. to the pint of finished syrup would.

3. That syrup carefully made by first process equals any of them in keeping.

4. That a syrup of hypophos. iron can be made by this process which is quite permanent, containing 2 grs. iron to each dram. The iron solutions were all green. But in adding them to the syrup hypophos. comp. etc., this color largely disappeared, leaving only a very slight tinge in No. 2, while the color increased with the amount of citrate potassium used. In sample containing 80 grs. iron to pint, the syrup remained of bright green color. This change of color was due to the hypophos. acid used in dissolving alkaloids.—West. Drug., 1893, 189.

Syrupus Ipecacuanhæ—Extract for the Preparation of.—100 Gm. of powd. ipecacuanha are moistened with 50 Gm. of alcohol and further macerated with sufficient glycerine and alcohol (50 to 200) for 10 days and finally percolated until 250 Gm. of percolate are obtained. 10 gm. of the latter to 90 of syr. simplex made an effective preparation of ipecac. —Mon. de la Pharm.; Zeits. Oest. Apoth. Ver., 1892, 431.

——— *Kola—Tonic.*—In Rev. gen. de Clin. et de Ther., 1892; Am. Jour. Pharm., 1893, 75.

(1) Ten to fifty drops of tincture of kola, in an infusion of black coffee, sweetened proportionately; or,

(2) An aromatic syrup prepared of tincture of kola, 20 Gm.; tincture of vanilla, 20 drops; simple syrup, 90 Gm., and sufficient distilled water or 160 Gm. The dose is 15 to 300 Gm. per day, according to age.

Syrup of Narceine.—M. Patrouillard proposes the following formula for an efficacious preparation: Narceine, 0.25 Gm.; sodium benzoate, 0.40

Gm., and simple syrup, 300 Gm. The two powders should be triturated in a mortar, so that the solution may be perfect.—Jour. de Pharm. et de Chim., 1893, 397; Am. Jour. Pharm., 1893. 282.

Syrups of Codeine and Morphine—Distinction between.—Denigès (Jour. de Méd. de Bordeaux, Aug. 7, 1892) uses Tanret's reagent for distinguishing between the syrups of the two alkaloids. The reagent is composed of potassium iodide 3.32 Gm., corrosive sublimate 1.35 Gm., distilled water 80 C.c., acetic acid 20 C.c. With syrup of codeine the reagent gives a precipitate or with syrup of 0.20 Gm. to the kilo of syrup an opalescence appears, while with morphine syrup, even of the strength of 1.25 Gm. hydrochloride to the kilo of syrup, no opalescence appears. Iodo-potassium iodide may be substituted for Tanret's reagent, and yields good results.—Am. Jour. Phar., 1892, 572.

Quinine Syrups—Crystallization in.—P. W. Squire finds the disturbing factor due to excess of acid.—Chem. and Drug., 1893, 422; Pharm. Era, May 15, 1893.

Syrupus Simplex.—F. Lascar writes upon what the United States Pharmacopœia requires this syrup to be; the syrups as found in the shops; the sugar employed the main fault of imperfect syrup; hints on preparing clear syrups, and the cause of many syrups spoiling.—Drug. Circ., 1893, 51.

TABLETS.

Compressed Tablets—Preparation of.—J. A. McFerran at one of the Pharmacy meetings in Philadelphia exhibited a machine for making compressed tablets and gave some valuable advice on their preparation.—See Am. Jour. Pharm., 1893, 213.

Compressed Tablets and Tablet Triturates.—J. H. Hahn replies to the question, "Does it pay the retail druggist to manufacture compressed goods?" The practical experience of the writer has led him to believe that it does pay, both directly and indirectly. He cites a not unusual case which is convincing of the economy and advertisement to the druggist who will manufacture his own compressed goods.

The secret of success depends upon having the powders properly prepared, before subjecting them to compression. For hypodermic tablets H. A. Wilson recommends the use of chloride of sodium as a base, but for sulphate of morphine, sulphate of sodium, and for acetate of morphine, acetate of sodium should be used.—Am. Jour. Pharm. 1892, 360, 361.

TINCTURÆ.

Tinctures—Examination of.—C. Fragner examined the tinctures of the Pharmacopœia Austriaca VII., prepared from the best raw materials, and obtained the following results:

	Sp. grav.	Solids.	Ash.	Alkaline.
Tincture of Aconite.....	0.901	2.96%	0.09%	
" Belladonna	0.9025	2.06	0.33	
" Cannabis indica.	0.902	1.46	0.08	
" Cantharides	0.819	1.89	0.03	
" Cinchona simp.....	0.903	3.64	0.08	
" Cinchona comp.	0.961	5.62	0.07	
" Colchicum	0.908	2.28	0.11	
" Conium.....	0.898	1.55	0.28	
" Digitalis	0.863	2.76	0.23	
" Ipecacuanha	0.896	1.67	0.10	
" Nux. Vomica	0.899	1.40	0.03	
" Opium simp	0.9235	5.01		1.004
" " comp.....	0.9815	5.28		1.14
" Strophanthus	0.8100	0.30	0.025	

—Pharm. Post, 1893, 94. [All 10 per cent. except Strophanthus, which is 5 per cent.—*Reporter.*]

Tincturæ.—In the Helfenberger Annalen, 1891, will be found a comprehensive table upon the specific gravity, residue, ash, acid equivalent and per cent. of alkaloid contained in tinctures.—Phar. Centralh., 1892, 438.

Tinctures.—An editorial on the labors of Farr and Wright.—Chem. and Drug., 1893, 482.

Tinctures—Alcoholic, of the French Pharmacopœia.—Domergue, in Jour. Pharm. Chim., 1893, 196.

Cinchona—Tincture of.—E. H. Farr and R. Wright, continuing their investigations on tincture menstrua, give particulars of their experiments with tincture of cinchona, and the results appear to indicate the advantage of the official macero-percolation process as compared with other methods in the preparation of this galenical. The details of the process of estimation are as follows: Ten C.c. of the tincture are introduced into a stoppered glass separator, and diluted with 50 C.c. water; a slight excess of solution of soda is then added, and the alkaloids removed by shaking—first with 10 C.c. and then with 3 successive 5 C.c. chloroform. The chloroformic solutions are drawn off in turn, mixed, and the alkaloids taken out by shaking with successive small quantities of acidulated water, until the latter ceases to give alkaloidal indications with Mayer's reagent. The acid solutions are mixed and made alkaline, and the liquid shaken—first with 10 C.c. and then with two successive 5 C.c. of chloroform. The latter is drawn off into a tared platinum dish, and evaporated over a water-bath, and the residue in a water-oven at 100°, and weighed.

They give two tables showing quantitative results of the examination of Tinctures of Cinchona; and results of experiments on process for making the Tincture. The most complete exhaustion of cinchona bark is made by the employment of a 70 or 80 per cent. menstruum. It is their intention to subsequently treat of the standardization of this tincture.—Chem. and Drug., 1892, 325.

Tinctura Coronillæ Variæ.—A tincture made from the leaves and twigs of Coronilla varia, and supposed to act better in heart troubles than digitalis. Dose, 2–4 Gm. of tinct. pro die or tinct. coron. var. 10.0, syr. coffee 30.0 : 15 drops, 3–6 times daily.—Merck's Ber., Jan., 1893.

——— *Digitalis, Pharm. Germ. III.*—Südd. Apoth. Zeit., 1892, 38; Pharm. Centralh., 1892, 500, 595. The following are the results of 56 experiments by numerous investigators : When tincture of digitalis, prepared from fresh leaves, was mixed with from one-half to one-third its volume of water, a turbidity, followed by more or less precipitation, was always produced. When, however, an equal volume of water was added, the turbidity amounted to milkiness in only 6 cases. The turbidity was greatest when one-half of water was added, and diminished on further dilution, but never to complete disappearance. This non-disappearance of turbidity, whatever the degree of dilution, is regarded by Clessler as the only reliable mark of distinction between tinctures made from fresh and dried leaves respectively ; since the latter, if mixed with one-third to one-half as much water, though also turbid at first, will soon become quite clear again. In his opinion, tincture of digitalis should be prepared only from fresh leaves of the flowering plant.

——— *Ferri Chloridi.*—W. J. Smythe finds that the method of F. B. Power (Proc. 1892, 906) for the determination of iron gives fairly constant results in the valuation of this preparation.—Pharm. Rund., 1892, 258.

——— *Ferri Oxydati Composita.*—Formula as published by the Apothecaries' Society of Berlin.—Zeits. Oest. Apoth. Ver., 1893, 305.

Tincture of Gelsemium—Estimation of Alkaloids.—E. H. Farr and R. Wright. The exact details of the process are as follows :

Fifty C.c. of the tincture are introduced into a porcelain dish and evaporated over a water-bath to low bulk, water being added, if necessary, until all spirit is removed. The residual liquor is allowed to cool, 1 C.c. semi-normal sulphuric acid added, and the liquor filtered through cotton-wool into a separator. The dish is rinsed, first with a little acidulated water, and then with 10 C.c. chloroform, and the whole transferred to the separator, and the mixture well shaken. After separation the chloroform is drawn off, and the process repeated with two successive 5 C.c. chloroform. The mixed chloroformic solutions are then shaken with two successive small quantities of acidulated water to remove mechanically-adherent alkaloid, and the acid washings added to the contents of the funnel. The latter solution is then rendered alkaline by the addition of ammonia in distinct excess, and the alkaloid extracted by shaking with two successive 15 C.c. and then with 10 C.c. chloroform. The chloroformic solutions are drawn off in turn and mixed, and the alkaloids taken out by agitation with four successive small quantities of acidulated water.

(Twenty C.c. distilled water are acidified with 2 C.c. dilute sulphuric acid B. P., and the mixture employed in four portions.) The acid alkaloidal solutions are mixed; an excess of solution of iodine in potassium iodide added, and the mixture allowed to stand until the precipitate has subsided and the supernatant liquid has become clear. The fluid portion is then poured upon a filter, and when filtration is complete, the filter is washed with a little distilled water, and is then transferred to the bottle containing the alkaloidal precipitate, and 5 C.c. 5-per-cent. sulphurous acid poured over it and allowed to filter into the bottle. The latter is then allowed to stand, with occasional agitation, until the alkaloidal periodides have been completely decomposed—indicated by the absence of dark-colored particles. The solution is then filtered from the lemon-colored residue, the bottle and filter rinsed with 2 or 3 C.c. sulphurous acid, and washed with water until the washings cease to give an alkaloidal reaction. The filtrate is then treated with a slight excess of ammonia, the alkaloids shaken out with 10 C.c., and then two successive 5 C.c. chloroform, the chloroformic solutions mixed, washed with ammoniated water, and then drawn off into a platinum dish and evaporated over a water-bath, and the residue dried at 100° C. The dish is finally transferred to a desiccator and allowed to cool, and is then weighed.

The authors give tables showing quantitative results of estimation of Tinctures of Gelsemium made by Macero-Percolation and by Continuous percolation. The most perfect exhaustion of the drug may be effected by the employment of a 60 or 70 per cent. menstruum, the former giving slightly better results. Table No. II gives results on mixing samples (1) with 90 per cent. alcohol and (2) with water. Table No. III shows result of experiments on process for making the Tincture. It is quite evident that perfect exhaustion of the drug can only be effected by the process of continuous percolation. The alkaloidal strength of the tinctures varies between the limits of 0.020 and 0.076 per cent., and it is evidently desirable that a fixed alkaloidal standard should be adopted for this tincture.—Chem. and Drug., 1892, 263.

——— *Green Hellebore.*—E. H. Farr and R. Wright find that the most perfect exhaustion of the drug is effected by a 70 per cent. menstruum. The following process was employed for the alkaloidal estimations:—50 C.c. of the tincture were introduced into a porcelain dish and evaporated over a water-bath, with addition of water, until all spirit had been removed. The residual liquor was acidified with dilute hydrochloric acid, and was filtered through cotton-wool into a glass separator. The deposited resin was found to retain a portion of the alkaloid, and it was therefore re-dissolved in a little 90 per cent. alcohol, the solution treated with acidulated water and again evaporated to drive off the spirit, and the liquid filtered into the separator. The mixed liquids were then rendered alkaline by the addition of ammonia in distinct excess, and the alkaloid

extracted by agitation, first with 10 C.c. and then with two successive 5 C.c. chloroform. The chloroformic alkaloidal solutions were drawn off in turn and mixed, and the alkaloids taken out by shaking with successive small quantities of 1 per cent. hydrochloric acid. The mixed acid alkaloidal solutions were then made alkaline with ammonia, and the alkaloids shaken out with 15 C.c. chloroform, used in three portions. Finally, the mixed chloroformic solutions were evaporated in a platinum dish over a water-bath, the residue dried at 100° C., and the dish transferred to a desiccator and the weight taken on cooling.

In addition to the estimation of total alkaloids they estimated the relative amounts of jervine and veratroidine (veratroidine=alkaloids other than jervine) present in the alkaloidal residue from each series of tinctures by Dragendorff's nitrate separation method. The residues from each series of tinctures were dissolved in 2 per cent. acetic acid, and the estimation made as follows:

A measured quantity of the acetic solution was treated with a few grains of potassium nitrate, and the mixture shaken and allowed to stand for some time. The clear liquid was removed with a pipette, the crystals washed with a little water, and the latter drawn off when clear. The mixed liquids were measured, made alkaline with ammonia, the alkaloid shaken out with chloroform, the latter solution drawn off and evaporated, and the residue dried and weighed. The jervine in the precipitated nitrate was estimated by shaking with ammoniated water and chloroform, the latter being employed in two or three portions in order to remove the last traces of alkaloid. After the weights had been taken, a correction was made in each case for the solubility of jervine nitrate. This was taken as 1 in 1,200, or 0.005 grams for each 6 C.c. solution, which was added to the weight of the jervine indicated, and subtracted from that of the veratroidine. The results are shown in Table II, and indicate the proportions of jervine and veratroidine in the mixed alkaloids obtained from 100 C.c. of tincture in each series, and also the percentages (1) of mixed alkaloids, and (2) of jervine, and (3) of veratroidine indicated in the rhizome from which each series of tinctures had been prepared. From Table III, showing results of process experiments, it is evident that the most perfect exhaustion of the rhizome of Veratrum viride may be effected by the process of continuous percolation.—Chem. and Drug., 1892, 651.

Tincture of Lobelia.—E. H. Farr and R. Wright give the following process for the estimation of the alkaloid in the Tincture of Lobelia:

"Fifty cubic centimetres of the tincture are introduced into a porcelain dish, and acidified with 5 drops of 33 per cent. acetic acid, 20 C.c. or 30 C.c. distilled water being subsequently added. The liquid is then evaporated over a water-bath (the water in the bath being kept just at boiling point) until the volume is reduced to 25 C.c. or 30 C.c. The extract is filtered through cotton wool into a separator, the dish and filter

rinsed with a little acidulated water, and the rinsings added to the contents of the separator. Ammonia is then added in distinct excess, and the alkaloid extracted by agitation—first with 10 C.c., and then with two successive 5 C.c. chloroform. The mixed chloroformic solutions are evaporated over a water-bath at a gentle heat, until the chloroform has been driven off; the residue treated, first with 10 C.c. and then 5 C.c. of 1 per cent. hydrochloric acid, and the acid alkaloidal solutions filtered into a separator. The liquid is then rendered alkaline by means of ammonia, and the alkaloid taken out by shaking, first with 15 C.c. and then with two successive 5 C.c. of absolute ether, s. g. 0.717. Finally, the ethereal solutions are run off into a platinum dish, the ether allowed to evaporate in a current of air, the alkaloid dried by exposure in a hot-air oven at 100° C. for one hour, and the dish with its contents transferred to a desiccator, the weight being taken after cooling."

As bearing upon the question of the volatility or otherwise of the lobelia alkaloid, they say that they have repeatedly exposed the alkaloidal residue obtained by the above process for several hours at a temperature of 100° C. without a loss in weight of more than 0.001 gram.

They recommend a 50 per cent. menstruum for the preparation of the tincture, and show in a table the superiority of the process of continuous percolation over other processes.—Chem. and Drug., 1893, 454.

Tinctura Lycopodii clavati.—Used in incontinence of urine in doses of 40 drops, 3 times daily.—Merck's Ber., Jan., 1893.

Tincture of Nux Vomica.—Andres has compared the relative values of preparations made according to the Russian Pharmacopœia of the 3rd (maceration) and 4th (percolation) editions with the following results:

	3 Ed.	4 Ed.
Sp. gr	0.904	0.912
Dried Extract	1.38	1.54
Strychnine and Brucine in per cent	0.22	0.31

—Pharm. Post, 1893, 184.

Tincture of Opium.—E. H. Farr and R. Wright find that the B. P. process does not extract all of the morphine from solution. They employed it only in conjunction with D. B. Dott's modification of the morphiometric process of Teschemacher and Smith. Three good samples of Turkey opium were estimated by the two processes, with the following results:

PERCENTAGE OF MORPHINE.

	Sample A.	Sample B.	Sample C.
B. P. process	11.89	12.74	14.27
T. & S. process	12.78	14.0	15.57

Three series of tinctures were now made from these standard powders,

by the B. P. process, with alcohol of 60, 50, 40, and 30 per cent. by volume.

The tinctures were estimated by the B.P. method, and also by the Dott-Teschemacher process, the former being adapted for the estimation of the tincture as follows:

"Seventy cubic centigrams of the sample were evaporated to about 20 C.c., the extract rubbed with 2 grams slacked lime, the mixture diluted with distilled water to 70 C.c. and allowed to stand for half an hour with occasional stirring. It was then filtered, 50 C.c. of the filtrate measured off and put into a 6 oz. flask with a close-fitting cork; 5 C.c. 90 per cent. alcohol and 30 C.c. absolute ether were then introduced, the mixture shaken, 1½ gram ammonium chloride added, and the mixture well shaken at intervals for half an hour. It was then allowed to stand for twelve hours, the ethereal layer removed by decantation, and the bottle rinsed with a further 10 C.c. ether, which was again decanted off. The precipitated morphine was collected upon the innermost of two counterpoised filters, the bottle being rinsed with several small portions of morphiated water, until all the morphine had been transferred to the filter. Finally the precipitate was washed with morphiated water until the washings came away colorless, the filter was allowed to drain thoroughly, and the morphine dried, first by gentle pressure, and afterwards in a hot-air oven at 100° C., and the weight taken."

Morphiated water was substituted for distilled water in washing the precipitated morphine, in order to obviate the variable amount of loss involved in washing by the B.P. process.

The results obtained showed that in order to obtain a tincture, by the B.P. process, containing .75 per cent. morphine, it would be necessary to employ opium containing not less than 12.5 per cent. morphine.—Chem. and Drug., 1893, 77.

——— *Morphiometry and the Total Alkaloidal Value of.*—E. H. Farr and R. Wright. The following process was adopted for the estimation of the tinctures:

Ten cubic centimetres of the sample were diluted with 5 C.c. water, 1 C.c. solution of potassium carbonate added, and the liquid shaken up with two successive 10 C.c. chloroform. The latter was drawn off, washed with a little water, evaporated to dryness, and the residue heated at 100° C. for one hour. It was then treated with 10 C.c. 1 per cent. sulphuric acid, the solution filtered into a separator, and the dish and filter rinsed with 5 C.c. water. An excess of potassium carbonate was then added, and the mixture shaken, first with 20 C.c. and then 10 C.c. absolute ether. The ethereal solution was evaporated to dryness, the residue dissolved in 10 C.c. 1 per cent. sulphuric acid, a very slight excess of solution of iodine in potassium iodide added, and the mixture well shaken and allowed to stand for fifteen minutes. Two cubic centigrams 5 per cent. sulphurous acid were

then added, the mixture shaken, allowed to stand for ten minutes, filtered through a plug of cotton-wool placed in the neck of a small funnel, an excess of potassium carbonate added, the alkaloids shaken out with two successive 10 C.c. chloroform, the chloroformic solution washed and afterwards evaporated, and the residue dried and transferred to a desiccator, and weighed after cooling.

A deduction of 0.005 for every 10 C.c. of tincture (= 0.050 per cent.) was afterwards made from the ascertained weight of alkaloid, representing the amount of morphine dissolved by the chloroform from the original solution.

Reference to the tables shows that whereas the proportion of morphine in the tincture increases as the alcoholic strength of the menstruum employed is diminished, the opposite rule holds good in case of alkaloids other than morphine.

From Table III. showing the results of experiments on several alternate processes for making the tincture, the authors conclude that the process which impressed them most favorably consists in the employment of moist opium, its thorough disintegration by rubbing down with cold water, followed by the addition of the alcohol, and subsequent maceration in the menstruum for several days.

They add that in their judgment this tincture should be standardized so as to contain the per cent. of morphine as at present, but that the official process for making it should be so modified as to admit of the employment of any good sample of opium for its production.—Chem. and Drug., 1893, 312.

Tinct. Opii—Percolation and Digestion.—Andres confirms the results of Martenson and Bienert that the method of digestion is to be preferred to that of percolation in making tinct. opii. This tinct. prepared by *digestion* according to the Russian Pharm. (3rd ed.) had the sp. gr. of 0.983, and gave extract 5.16 per cent. and morphine 1.06 per cent. That prepared by *percolation* after the 4th ed. had the sp. gr., 0.976, and yielded extract 4.88 per cent. and morphine 0.87 per cent.—Pharm. Zeitschr. Russl., 1892, 807 ; Pharm. Post, 1893, 59.

Laudanum of Rousseau or *Tr. Opii Prepared by Fermentation.*—A. Lamal.—Bull. Acad. Roy. de Med. de Belg., 1892, 238.

Tinctura Rhei.—W. Warrington recommends the addition of 10 per cent. of glycerin to this galenical. By this means, he claims the precipitation is prevented and the tincture rendered more permanent. Western Drug., 1892, 325.

——— *Saffron in.*—Chem. and Drug., 1892, 600, 614.

Tincture of Rhubarb—Kohlreuter's.—

Rhubarb, cut fine	45 parts.
Orange peel, cut fine	15 parts.
Centaurium, cut fine	45 parts.
Fennel, crushed	4 parts.
Alcohol	150 parts.
Water	150 parts.

Mix, and macerate for eight days. Strain and filter.—Nat. Drug., 1893, 209.

Tincture of Rhus radicans is prepared by macerating one part of the dry leaves in five parts (by weight) of alcohol of 21 per cent. for two weeks, expressing and filtering. This tincture has been used by Dr. Saint-Philippe of Bordeaux with good success in nocturnal incontinence of urine, a cure having been effected in one-third of the cases treated, the remaining ones being improved. The dose is five drops morning and evening for children from 2 to 6 years, and for the latter age may be gradually increased to 40 drops. The medicine is readily tolerated, producing only mild dyspnœa and slight vertigo in certain children. The author adds that the quality of the medicament should be investigated in case favorable results be not obtained.—Jour. Med. Chir. prat., 1892, 761; Am. Jour. Pharm., 1893, 15.

Tincture of Strophanthus.—Walter Warrington recommends the following:

Strophanthus, in No. 30 powder	6.25 Gm.
Alcohol,	
Water, each, a sufficient quantity to make	250 C.c.

Mix alcohol and water in the proportion of 2 parts of alcohol and 1 part of water, by volume; with a sufficient quantity of this menstruum digest the drug for two days at a temperature of 150° F. Then pack in percolator and gradually pour on menstruum until 250 cubic centimeters of tincture have been obtained.

Subject the resulting tincture to a temperature of 32° F. and filter out the fatty matter, which is of a green color and a buttery consistence.

This process is very simple and entirely free from the objectionable features which attend the use of ether or benzin.—West. Drug., 1892, 448.

——— J. A. Koch proposes to replace ether by petroleum benzin.

Strophanthus seed	10 parts.
Broken glass	5 parts.
Benzin, alcohol, water, of each	enough.

Powder the strophanthus seed and the glass together in an iron mortar,

and dry it at a temperature of 50° C. Weigh, deduct the weight of the glass used, and from the remainder (weight of dry seed) calculate the weight of the finished product. One part of dried seed to make twenty (20) parts of tincture.

Pack the strophanthus into a suitable percolator, pour on enough benzin to saturate the powder, cover and macerate during twenty-four hours. Then allow the percolation to proceed, gradually pouring on benzin, until a drop evaporated on a watch-glass ceases to leave a greasy stain. Remove the marc from the percolator and dry it, first in the open air and then at a temperature of 50°C., until free from odor of benzin. Again reduce to powder, moisten it with a mixture of 70 parts of alcohol and 30 parts of water, repack it in the percolator, and macerate during forty-eight hours. Then percolate with the mixture of 70 parts of alcohol and 30 parts of water until 20 parts of tincture are obtained for each part of dried seed used.—Notes on New Rem., 1892, 21.

[The boiling point of the benzin should be 60° C. Ether is preferable on account of the difficulty of securing a pure benzin.—*Reporter.*]

Troches.—See Lozenges and Pastilles.

UNGUENTA.

Ointment Block.—J. W. England.—Quite a bright idea is this new ointment slab or block, made of a number of sheets of parchment paper, backed card-board, and manufactured by Fox, Fultz & Webster, of Boston. The object of the block is that an ointment can be made upon the top sheet of the layer, the sheet removed and thrown away, and the slab will be ready for another ointment; thus doing away with the usual ointment slab and its frequent cleaning. Practically, however, there will be found several objections to its use. First, with a stiff ointment it will be hard to thoroughly admix ingredients; second, ointments may be smeared over its sides and spoil the lower sheets; and third, the parchment paper may decompose chemical products mixed on it. Upon this sample "block," the author made some iodine ointment, but noticed that the iodine had decomposed the paper. Still, the "block" is an ingenious idea, and may find a certain application in the making of ointments.—Am. Jour. Pharm., 1893, 7.

Ointment Bases.—J. V. Shoemaker.—Med. News, 1893, 449.

Unguentum Hydrargyri—Preparation.—Barnhard modifies Tardy's process (L'Union pharm., March, 1891), as follows:

Take of mercury, 100 Gm.; benzoinated lard, 90 Gm.; and lanolin, 10 Gm. Triturate the mercury and the lanolin; add 10 drops of castor oil, triturating again for a few moments; then incorporate 20 Gm. of the benzoinated lard, triturating energetically until the mercury globules have completely disappeared, which will take about five minutes, when the rest

of the benzoinated lard is added. Operated in this way, the preparation is completed in fifteen minutes, and responds to all the reqirements of the Codex.—Soc. de Pharm. de l' Eure ; Am. Jour. Pharm., 1893, 78.

——— Greuel confirms Hallberg's recommendation of using lanolin for extinguishing the mercury.

Bowman, acting upon the suggestion of Jaquemaire, has tried several amalgams, and finds that magnesium amalgam (1-1000 of mercury) acts in the shortest time.

Assay. Heat with alcoholic solution of potassa, wash with alcohol, and finally with ether ; weigh the mercury. Kremel and Dieterich use a mixture of sixty grams of ether, five grams of alcohol and six to eight drops of hydrochloric acid ; washing the mercury finally with ether, then weighing. Unger saponifies the fat with alcoholic solution of potassa, adds hot water and phenolphthalein, and titrates with normal hydrochloric acid.—Meyer Bros. Drug., 1893, 55.

——— A recommendation by H. Borntraeger, according to which it is possible to make an ointment containing 98 per cent. metallic mercury, consists in triturating the mercury with oleate of mercury ; the ointment of this strength is suitable for preparing the official ointment by diluting with lard. It is also considered feasible to change the liquid character of mercury to that of a solid with the aid of a little oleate of mercury, and thus avoid the shipment of a troublesome liquid ; after transportation ether will extract the oleate, leaving the mercury again in the liquid state.—Pharm. Post, 1892, 1245 ; Am. Jour. Pharm., 1893, 12.

Testing Mercurial Ointment.—F. Boyeldieu recommends the saponification of the ointment by heating ten grams with caustic soda and weak alcohol. When the soap is dissolved and the separated mercury has settled to the bottom, the solution is decanted off, the deposit again boiled with some alkali and spirit, and finally washed with ether. When the mercury is clean, it is dried with filter paper and weighed.—L'Union Pharm., 1892, 432 ; Phar. Jour. (Aus.) 1893, 20.

Red Oxide of Mercury—Ointment of.—F. Davis suggests that the frequent lumpy condition of this ointment is probably the result of a separation of the hard paraffin in consequence of too rapid cooling in its preparation. He recommends that the vessel in which the ointment is made should be placed in warm water and that the ointment should be occasionally stirred while cooling.—(Brit. Pharm. Conference) Phar. Jour. and Trans., 1892, 206.

Unguentum Myrrhæ made by heating together one part myrrh with ten parts of a mixture of wax and fixed oil, is used in eczema, answering as well as some of the newer antiseptics.—Pharm. Centralh., 1892, 500 ; Am. Jour. Pharm., 1892, 523.

Unguentum Potassii Iodidi, free from crystalline particles, is best ob-

tained by using a solution of definite strength of the salt in glycerin instead of in water. According to Jour. de Phar. d'Anvers, June, 1892, such a solution keeps for an indefinite length of time. This practical method was first recommended by the Bulletin de Pharmacie du Nord.—Am. Jour. Pharm., 1893, 14.

——— Working by the following process a large portion of potassium iodide can be incorporated with the base. The iodide is pulverized and dissolved in a sufficient quantity of hot glycerin (1 Gm. to about 2.50 Gm. glycerin); then mix this solution with petrolatum. The solution can be preserved for a long time, if kept in yellow glass bottles.—Bull. de la Soc. de Pharm. de Lyon; Am. Jour. Pharm., 1893, 174.

Salol-vaselin.—Made by melting 1 Gm. salol with 9 Gm. vaselin and stirring until cool. Used for chapped hands and lips, also for rough skin. —A Suchomel, Pharm. Post., 1892, 954, 955.

Unguentum Veratrina.—See Spatulas.

VINA.

White Wine—Trials of Different Methods of Preparing—J. A. Müller. —Bull. Soc. Chem. de Paris, Jan. 5, 1893.

Red Wine—Composition of.—Ibid. (Abstract in Chem. News, 1893, 133.)

Fruit Wine—Chemical Composition of Apples and Pears, especially with regard to their Utilization for.—P. Kulisch.—Abstract, Jour. Chem. Soc., 1893, 37.

Vinum Pepsini (*Pharm. Germ. III.*)—Preparation of.—Pharm. Centralh., 1892, 742.

Wine of Phosphates.—Employment of bi-phosphate of lime by G. Lincas, in Rép. de Pharm., 1893, 59.

Tetracarbon Aldehyde in a Brandy—Occurrence of a.—J. A. Müller.— Bull. Soc. Chim. de Paris, 6, 796; Jour. Chem. Soc., 1892, 810.

Acidity of Wine derived from Fixed and Volatile Acids—Determination of.—J. A. Müller.—Ann. Chim. et Phys., 25, 118.

Acid in Red Wine—The Determination of.—Seiler, in Rev. inter. des falsif., 1892, 103; Pharm. Centralh., 1892, 720.

Alcohol in Wine—Estimation of—A Pocket-Ebbullioscope for.—H. Kapeller.—Zeitschr. f. analyt. Chem., 1892, 301.

Alum in Wines—Detection of.—N. de Colli.—Abstract, Jour. Chem. Soc., 1892, 1523.

Wines, Boric Acid in.—In connection with the fact that a recent French law prohibits and renders punishable the addition of boric acid to wines, it is interesting to note that M. Gassend, in the course of a research

on the acid, discovered that it existed in wines in a normal state.—Pharm. Jour. and Trans., 1892, 6; Bull. de Phar. de Bordeaux, 128.

——— *Determination of the Acidity due to Fixed and Volatile Acids of.* —J. A. Müller.—Bull. Soc. Chim. de Paris; Chem. News, 1893, 37.

Chlorine in Wine—Estimation of.—Solaro.—Abstract, Jour. Chem. Soc., 1893, 233.

Citric Acid in Wine.—Estimation.—Klinger and Bujard.—Abstract, Jour. Chem. Soc., 1893, 54.

Coloring Matters in Wine.—Marouby proposes a new process for detecting foreign substances and especially coloring matters in wine.—Abstract Chem. News, 1893, 133; from Bull. Soc. Chim. de Paris, Jan. 5, 1893.

Extract in Wine.—P. Carles considers its alimentary nature, its influence upon the preservation of the wine, and its commercial value.—Jour. Pharm. Chim., 1893, 208.

Extractive in Wine—Determination of.—Medicas.—Abstract, Zeitschr. f. anal. Chem. 1893, 362.

Extract left on the Evaporation of Wine.—J. A. Müller determines the weight of dry extract left on the evaporation of a wine at 100° C, and the extract left on evaporation in a dry vacuum.—Chem. News, 1893, 121; from Bull. Soc. Chim. de Paris, Jan. 5, 1893.

Glycerin in Wine—Estimation of.—G. W. Barth.—T. Lecco.—Chem. Zeit., 16, 504; Pharm. Centralh., 33, 274.

——— Pharm. Centralh., 1892, 583.

Glycerin in Wine and Other Fermented Liquors.—Estimation of.—Salvatori.—Staz. Sper. Agrar., xxi, 141; Jour. Chem. Soc., 1893, 248.

Glycerin in Sweet Wines.—Estimation of.—Lecco adds 1 gram of calcium hydroxide to 10 C.c. of wine. The estimation of glycerin is then carried out as usual by the method previously described (Chem. Zeit. xiv, 504).—Ber. d. Chim. Ges., xxv, 2074.

——— G. Baumert.—Arch. der Pharm., 230, 324.

Iron in Wine.—Detection and amount in.—Jour. Pharm. Chim., 1893, 484.

Grape-Must in Algeria.—Rotatory Power of.—H. and A. Malbot.—Ibid.

Phosphoric Acid in Wines.—Determination of.—Morgenstern and Parlinoff, in Jour. Pharm. Chim., 1893, 482. The authors have tried the molybdate and the citrate methods, and they find that the latter gives the best results. They apply their simplified method directly to the wine, without first submitting it to evaporation, and without calcining the dry residue, thereby avoiding considerable loss of time. 200 C.c. of wine are

placed in a conical glass, boiled for some time to remove alcohol, 20 C.c. of nitric acid, sp. gr., 1.38, added, and the boiling continued to eliminate the greater part of the nitrogen oxides. After cooling, ammonia is added to neutral reaction, and to the cooled liquid 50 C.c. ammonium citrate are added. Then add drop by drop, and stirring constantly, 50 C.c. magnesium mixture, when ammonio-magnesium phosphate will at once deposit. The pyro salt obtained after calcination is entirely white.—Am. Jour. Pharm., 1893, 280.

Sugar and Tannin in Wine.—Estimation of.—Vögel.—Zeitschr. f. angew. Chem., 1891, 449.

Potato Starch Sugar in Wines—Recognition of.—W. Fresenius.—Zeitschr. f. Anal. Chem., xxx, 669.

Sulphurous Acid in Wine.—M. Ripper.—Jour. f. prakt. Chem., 46, 428.

——— A. Kleiber.—Abstract. Pharm. Centralh., 1893, 199.

——— Doubt exists as to the amount of sulphurous acid that should be allowed in wine, and the German law does not define a limit. It has recently been ascertained by Schmitt that choice wines of the previous century contain large amounts of sulphurous acid, much in excess of what is held to be admissible. This acid is thought to be in combination with an aldehyde. Schmitt considers that free sulphurous acid is only to be found in freshly sulphured wine, and that it is rapidly combined with aldehyde products formed by gradual oxidation (Weinbau, etc., through Pharm. Centr., No. 42, 617).—Phar. Jour. Trans., 1892, 343.

Tannin in Wine—Estimation of.—Chiaromonte.—Abstract, Jour. Chem. Soc., 1893, 311.

Tartar in Sweet Wines—Determination According to the Method of Berthelot and Fleurien.—E. Ackerman.—Zeitschr f. anal. Chem., xxxi, Part 4; Abstract, Chem. News, 1892, 197.

Bitartrate of Potassium in Wines.—Comparison of different wines.—Jour. Pharm. Chem., 1893, 484.

Cream of Tartar in Wine Lees—Estimation of.—Balli.—Chem. Zeit., xv, 989.

Wine Statistics of Germany.—Zeitschr. f. anal. Chem., 1892, 607–661.

PROCEEDINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

ALABAMA.

Proceedings of the Eleventh Annual Meeting of the Alabama Pharmaceutical Association.—Held at Mobile, May, 1892. The following papers were read:

Preliminary Education of Students of Pharmacy and Medicine.—C. A. Mohr.

The National Formulary.—P. E. Ebrentz discusses the criticisms and

advantages of the National Formulary. He gives a number of comparisons, showing the commercial advantage to the pharmacist by his compounding preparations according to the National Formulary.

The National Formulary.—A. E. Brown.

The Practical Uses of the Metric System and its Advantages over other Systems of Weights and Measures.—P. C. Candidus.

What is Meant by Nascent State?—T. P. Boyd.

ARKANSAS.

Tenth Annual Meeting of the Arkansas Pharmaceutical Association.—Held at Fort Smith, June, 1892. The following papers were read:

An Improved Process for Making Tincture of Opium.—J. A. Ginocchio.

The Difference Between English and American Calomel.—J. M. Anderson.

Practical Pharmaceutical Notes.—W. W. Kerr and J. W. Beidelmann. Two papers.

The Value of Pharmaceutical Associations and How to Make their Meetings Entertaining.—G. N. Hart.

Tests for the Identification of Ordinary Drugs and Chemicals.—E. T. Mitchell.

Eleventh Annual Meeting of the Arkansas Pharmaceutical Association.—Held at Little Rock, May, 1893. The following papers were read:

A Pessimistic View of Pharmacy.—J. W. Beidelmann.

How to Arrange the Drug Store.—W. H. Skinner.

Discussions upon the following queries:

How shall we Make Medicated Waters?

What Kind of Water do you Use in Prescription Work?

CALIFORNIA.

Proceedings of the Semi-annual Meeting of the California Pharmaceutical Society.—Held at Los Angelos, May, 1892. The following papers were read:

An Improvement on the Formula for Syrup of Phosphates of Iron, Quinine and Strychnine.—S. A. McDonnel. The author recommends the following:

Ferri Phosphatis (scales)	gr. xxxiii ⅓—or 100
Quininæ (alkaloid)	gr. xxxiii ⅓—or 100
Strychninæ	" I —or gr. iii.
Acidi Phosphoric (50 per cent.)	Fluid ʒ ii et ⅔—or Fl ʒ i
Glucose (white thick syrup)	q. s. ad fl ʒ iv—or Fluid ʒ xii.

M. Sec. Art.

What is the Cause of the Darkening of Syrups containing Phosphate of Iron?—S. A. McDonnel.

It is claimed by practitioners, that the formula of the U. S. P. 1870 for

Tinctura Ferri Chloridi gives better therapeutic results than the present.—S. A. McDonnel.

Animal Charcoal for Decolorizing—The Preparation and Use of.—H. F. Meier.

Grocer's Drugs.—I. H. Hood and A. J. Hassler. An examination of the quality of the following drugs and medicines sold by grocery and bazar stores: Spirit of camphor, cream of tartar, bicarbonate of soda, tartaric acid, castor oil, laudanum, asafoetida gum, senna leaves, glycerin, seidlitz powders, ammonia water.—(Reprinted in Drug Circ., 1892, 245.)

Rectal, Gelatine Filled Capsules.—A point in dispensing.—S. A. McDonnell.

Oxygen.—C. W. Faulkner. The presence of dioxide manganese influences the yield of oxygen from potassium chlorate by mechanical means and not by catalytic action.

Compound Cathartic Pills.—W. M. Searby recommends and uses the following formula:

Compound Extract of Colocynth	130 grs.
Resin of Jalap	15 grs.
Calomel	100 grs.
Gamboge	25 grs.
Powdered soap	100 grs.
Total	370 grs. to make 100 pills.

He claims for this formula: 1st, greater uniformity in strength; 2d, greater facility in making up the mass; 3d, less liability of losing their form; 4th, the almost entire absence of griping when administered in ordinary doses.

Some Pointers in Detail.—A. B. McNeal. Followed by a lengthy discussion upon the details in running the drug-business.

The Paddock Pure Food and Drug Bill.—A bill for preventing the adulteration and misbranding of food and drugs and for other purposes was read.

Quinine Tannate.—A. C. Zeig.

What Studies Should a Young Man take up who Intends to enter a College of Pharmacy?—W. M. Searby.

Emulsion of Petroleum.—S. A. McDonnel proposes the following:

Olei Petrolei	16 oz.
Acaciæ pulveris	8 oz.
Glycerin	4 oz.
Calcii hypophosph.	
Sodii hypophosph, āā gr.	cclxxxviii.
Aquæ, q. s. ad 3 pints.	
M.	

Add the acacia to the oil and mix thoroughly (in a large mortar); then

add one pint of water (all at once), and rub briskly until the emulsion is formed. Dissolve the hypophosphites in a half pint of water, to which add the glycerine; then add all to the emulsion and rub well together—and any water necessary to make up the measure of three pints of finished product. Flavoring may be added.

Some Hints and Other Things.—J. W. Wood.

Aromatic Spirit of Ammonia.—S. A. McDonnel submits the following: Having copied out your quantities, take of ammonium carbonate in hard, translucent pieces; rub with a portion of the water, in a wedgewood mortar, until free from lumps, then add balance of water and transfer to a suitable bottle; then add the water of ammonia and skake until nearly all is dissolved; dissolve the oils in the alcohol and add to the solution of ammonium carbonate and water of ammonia, then shake—instantly the contents of the bottle become, as it were, a solid mass, the alcohol uniting with the water so rapidly as to throw the ammonium salt out of solution; and we must wait until some of the possibilities mentioned in the first part of this paper favor a resolution, which is brought about by setting the bottle aside for a few days, with occasional agitation. When all is redissolved, then filter.

Benzoinating Lard—A Ready Method for.—Geo. Harvey recommends the following process: Balsam Peru, 4 oz. av. Purified Lard, q. s. to make, 16 oz. av. Heat 12 ounces of lard to 200° F., add the Balsam Peru slowly and with brisk stirring, maintaining about the same temperature until all of the balsam has been added. Keep the mixture in a fluid condition at a somewhat lower temperature for half an hour or less, to allow the resin to collect at the bottom of the vessel, when the fluid portion containing the aromatic and oily constituents dissolved in the lard may be decanted, and sufficient lard added to make the weight 16 ounces av. This should be constantly stirred until cold, so as to insure a perfect homogeneous mixture; which is of a light amber color, and represents twenty-five per cent. of the original balsam.

Does Hayden's Viburnum Compound Contain Morphine?—S. A. McDonnel finds that oil of cloves gives similar reactions to morphine.

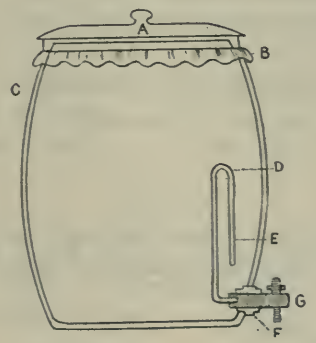
Co-operation Among Druggists.—J. G. Steele.

Aqueous Solutions of Alkaloids—What Antiseptic is best suited for—S. A. McDonnel recommends chloroform water of about one-half per cent.

Automatic Lime Water Device.—F. T. Green. The apparatus consists of an earthenware crock of six gallons' capacity, with lid and perforation for faucet. This crock can be had of almost any dealer in earthenware. A wooden faucet is firmly inserted, and made tight by means of a perforated cork of proper size. When the faucet is in place the siphon of heavy glass tubing, bent as shown in cut, is then inserted. The object of the piece of

rubber sheeting under the cover is to keep out the air laden with carbon dioxide. The carbon dioxide forms a carbonate of calcium, which shows itself as a film on top of the lime water. The calcium carbonate will not fall, however, and cause the lime water to be turbid, unless touched—even the act of drawing off lime water does not break the film. The rubber sheeting prevents a free circulation of air, so there is never much calcium carbonate formed. To fill the jar buckets of water are poured on slaked lime. In the act of settling, the suspended lime cannot get into the faucet, owing to the bend in the siphon tube, D. The siphon is bent toward the faucet, so as to give more room in the interior of jar for cleaning or stirring. However, it needs no stirring, for a bucketful of water dashed into it in the act of replenishing does that completely. It costs about three dollars. When lime water is called for, simply fill up their bottles from the faucet, cork, label, wrap, and that ends it. When the container gets low dash two buckets of water into it.

FIG 57.



Automatic Lime Water Device,

C. Crock or earthen jar, perforated for a faucet; capacity, six gallons.
A. Earthen cover for jar.
B. Rubber diaphragm, held in place by a hoop or elastic band, and with one or two perforations in rubber sheetings to let in *some* air.
D and E. Glass siphon tube, inserted in wooden faucet, G.
F. Hole for faucet in jar.

Interrupted or Suspended Percolation versus Continued or Regular Percolation.—C. A. Seifert.

On an Agreeable Method of Administering Saline Cathartics.—E. A. Heinzeman.

CONNECTICUT.

Proceedings of the Sixteenth Annual Meeting of the Connecticut Pharmaceutical Association.—Held in Hartford, February 1892. The following papers were submitted:

Report on the Progress of Pharmacy.—By E. T. Vance.

Pill Excipient for General Use.—N. A. Upham suggests the following:

Powdered acacia	1 drachm.
Powdered tragacanth	2 drachms.
Glucose	5 drachms.
Glycerin	3 ounces.

Mix the powders in a suitable dish, and thoroughly incorporate the glycerin and glucose until a perfectly smooth mixture is obtained, then apply sufficient heat to thicken. When cold, transfer to a screw-cap ointment jar or other convenient receptacle.

Albumin Test.—G. F. McGuire values sulpho-salicylic acid for bedside urinary testing.—Bull. Pharm., 1893, 109.

COLORADO.

Third Annual Meeting of the Colorado Pharmaceutical Association.—Held at Denver, August, 1892. The following papers were read:

Adulteration and Sophistication.—N. Anderson.

Antiseptics, Germicides, Disinfectants and Deodorizers.—C. D. Lippincott.

Chemical Resources of Colorado.—N. Anderson.

What makes the Successful Pharmacist?—C. S. Kline. (See Drug. Circ., 1892, 267).

FLORIDA.

Proceedings of the Seventh Annual Meeting of the Florida State Pharmaceutical Association.—Held at Jacksonville, May, 1893. The following papers were read:

The Cutter.—A. E. Philips.

Interstate Retail Druggists' League.—R. J. Martinez.

Substitution.—H. C. Cushman.

Trillium erectum (Rattlesnake's Master).—J. D. Palmer.

Sabbatia Elliottii (*Quinine Flower*).—J. D. Palmer. A description with an account of the properties and preparation of the decoction, fluid extract, extract and tincture.

Sarracenia flava (Trumpet Plant).—J. D. Palmer. An account of the properties and preparation of the fluid extract and tincture with a description of this plant.

Medicinal Plants of Florida.—J. D. Palmer. Part II. Beginning with No. 36., he considers nine others (See former Proc. of the Assoc.): Geranium maculatum, Taraxacum, Liatris odoratissima, Cornus florida, Sambucus canadensis, Triosteum perfoliatum, Linum, Illicium (Florida Anise), Pinckneya (Florida cinchona). The author describes these plants and their properties and preparations.

GEORGIA.

Proceedings of the Seventeenth Annual Meeting of the Georgia Pharmaceutical Association.—Held in Columbus, May, 1892. The following papers were read:

Best Method of Preparing Beef Wine and Iron.—J. P. Turner. The author detannates the wine with hot milk.

Pharmacy—Its Lights and Shadows.—Harry Sharp.

Finances of Pharmacy.—C. M. Crosby.

The More Efficient Home Training for Students of Pharmacy.—J. P. Miller.

Fluid Extract of Cascara Sagrada.—J. W. Turner.

What of Your Association?—S. C. Durban.

Why does Tincture of Iron made from Concentrated Solution form a Precipitate?—G. F. Payne.

INDIANA.

Proceedings of the Indiana Pharmaceutical Association.—Held in Indianapolis, May, 1892. The following papers were read:

The Commercial Side of Pharmacy.—Frank Carter.

Paddock Pure Food Bill.—A report on.—By Geo. W. Sloan.

Method of Assay.—J. U. Lloyd.

Lecture to State Pharmaceutical and State Medical Societies.—By J. P. Remington.

IOWA.

Proceedings of the Thirteenth Annual Meeting of the Iowa State Pharmaceutical Association.—Held at Davenport, June, 1892. Discussion of queries—no papers read upon them.

KANSAS.

Proceedings of the Fourteenth Annual Meeting of the Kansas Pharmaceutical Association.—Held at Wichita, May, 1893. Contains Reports of the Committees upon Queries, Trade Interests, Adulterations and Board of Pharmacy. Also the following papers:

Science, Theoretical and Practical.—L. E. Sayre.

Magnetic Dust.—E. B. Knerr.

Uniformity in Pharmaceutical Preparations.—W. S. Amos.

Insects Injurious to Drugs.—L. E. Sayre and S. J. Hunter have examined the following drugs received from different parts of the U. S.: Mentha piperita, Althaea officinalis, Scutellaria lateriflora, Artemisia Absinthium, Datura Stramonium, powd. Capsicum, orris root, Zingiber officinale and condition powders. These were infested by *nicobium hortum*. Caraway seed contained the larva of a beetle. Fenugreek contained *anthrenus varius*. Powd. marshmallow, ext. of licorice and almond meal

contained the well-known Silvanus surinamensis. Cantharides contained a white mite. They examined bone and horn combs and found them to be destroyed by a beetle.

[The paper is well illustrated and the authors are doing a most important work. Pharmacists can assist in this work by examining their stock of drugs and sundries and in case of any destruction should communicate with L. E. Sayre, Department of Pharmacy, University of Kansas.—*Reporter.*]

Phosphoric Acid.—S. R. Boyce examined 8 commercial samples. One sample contained arsenic. Sulphuric acid in one sample, 0.02 per cent. Hydrochloric acid in one sample, 0.17 per cent. The per cent. strength of acid varied from 10.6 to 93.6.

What Galenicals Can be Made by the Retail Pharmacist?—A. W. Youngberg has compared the cost of some preparations as made by the pharmacist and wholesaler and tabulated them as follows:

FLUID EXTRACT PER POUND.

	Cost to Manufacture.	Wholesale Price.
Aconite	$ .77	$1.10
Rhubarb	1.75	2.20
Belladonna Root	.86	1.35
Digitalis	.82	.95
Ipecac	3.21	4.50
Jaborandi	.75	1.20
Cinchona, Yellow	1.00	1.20
Senega	1.45	2.10

SOLID EXTRACTS PER OUNCE.

Aconite	.46
Belladonna Leaves	.31
Hyoscyamus	.75

TINCTURES PER PINT.

Aconite	.46	.65
Capsicum	.32	.50
Nux Vomica	.43	.60
Opium Camphorated	.21	.45
Opium	.46	.85
Iodine	.78	.85
Arnica	.35	.50

LINIMENTS PER PINT.

Chloroform	.42	.75
Soap	.30	.60

SOLUTION PER PINT.

Fowler's	.03	.15

POWDERS PER POUND.

Dover's	.85	1.15

	SYRUPS PER PINT.		
Acacia	.18		.50
Wild Cherry	.13		.40
Rhubarb	.30		.60
	SPIRITS PER PINT.		
Lemon	.44		.60

Chemicals which Can be Profitably Made by the Retail Pharmacist.—De F. Baker, with a list of apparatus costing $6.04, has compared the cost to the pharmacist with the purchased products, as follows:

	Cost of manufacture per oz.	Wholesale price per oz.
Red iodide of mercury	$.24	$.34
Potassium cyanide	.03¾	.05
Precipitated carbonate of zinc	.02¼	.03
Nitrate of lead	.01	.01
Citrate of bismuth	.17	.27

Estimation of Colchicum and Its Preparations.—E. F. Walleck. Analysis of alkaloid in crude drug: Powdered seed, 0.34 per cent.; root (corm), 0.45 per cent. Analysis of preparations: Wine of seed, prepared by myself, 0.048 per cent.; wine of seed, obtained in open market, yielded 0.063 per cent. A sample of commercial colchicine contained about 40 per cent. of impurity.

Dialyzed Pepsin Compared with Ordinary Pepsin.—A. P. Rudiger.

Vanillas.—N. H. Seiler has examined the commercial vanillas.

New Remedies.—L. E. Sayre gives references to the work upon.

Echinacea angustifolia.—S. R. Boyce finds it to contain 4½ per cent. of oleoresin, nearly one-half of which is a straw-colored volatile oil, and one-sixth colorless fixed oil, the remainder being resin.

Aseptol.—L. H. Bergman.

Percentage of Moisture and Extractive in Crude Drugs.—A. J. Lieurance. The figures in the fourth column represent the percentage of menstruum required to extract the virtues of the drug that were apparent to taste. The calculations were based upon the drug.

TABLE SHOWING AMOUNT OF EXTRACTIVE AND MOISTURE.

DRUG.	Per Cent. of Extractive 1st Percolate.	Per Cent. of Extractive 2d Percolate.	Total Extractive in Percolates.	Menstruum required for No 1.	Per Cent. of Moisture from Air-Dry Drug.
Aconite	9.50	4.65	14.15	3.80	8.3
Apocynum can	12.48	1.92	14.40	3.92	8.3
Belladonna fol.	19.36	3.34	22.70	9.40	10.8
Burdock	19.16	4.84	24.00	6.00	10.9
Buchu	16.82	6.48	23.30	6.80	8.7
Belladonna rad.	5.496	4.154	9.65	6.00	8.0
Colchicum rad.	13.64	5.86	19.50	5.06	7.7
Cannabis ind.	9.78	3.22	13.00	4.64	8.7
Coca fol.	18.90	5.80	24.70	6.00	8.0
Conium fol.	21.30	7.30	28.60	5.52	7.5
Colchicum sem.	15.32	4.15	19.47	6.76	8.7
Digitalis	27.52	6.58	34.10	8.80	8.9
Gelsemium	8.00	3.60	11.60	7.24	7.2
Hydrastis	15.90	7.30	23.20	8.56	8.3
Hyoscyamus	13.80	5.70	19.50	10.00	8.1
Hydrangea	8.38	.68	9.06	5.60	7.1
Ipecac	10.768	1.682	12.45	4.24	9.6
Lily of Valley.	27.96	5.54	33.50	8.40	7.0
Nux vomica	7.50	6.20	13.70	10.00	7.5
Mezereum.	8.38	3.42	11.80	5.74	8.2
Podophyllum	12.50	1.30	13.80	3.20	7.1
Poke root	12.68	4.44	17.12	5.10	7.7
Pleurisy root	20.30	4.90	25.20	5.44	8.0
Stramonium sem.	11.96	2.14	14.10	4.72	7.4
Veratrum.	9.62	8.38	18.00	4.56	11.6
Viburnum	10.44	4.76	15.20	3.60	7.6
Yerba santa	28.94	3.05	31.99	6.64	7.6
Jaborandi	19.60	3.98	23.58	4.92	7.8
Cinchona.	36.762	1.258	38.02	11.80	7.0
Senna fol.	28.66	.36	29.02	11.92	4.96
Opium.	57.69	1.96	59.65	23.35	4.8
Lactucarium*.	10.46	2.55	13.01	10.46	3.238

* Ether extract from lactucarium was equal to 41.35 (principally fat).

Glucosides.—B. A. Watt and W. E. Wilson.

Test the Quality and Coloring Power of Commercial Pigments.—M. Noll.

Drug and Plant Analysis.—L. E. Sayre. A condensed view of this subject for beginners.—See also Notes on New Rem., 1892, 91.

Elixirs.—A classification of the elixirs of N. F. according to their therapeutical action with some suggestions regarding their preparation.—G. B. Norberg.

Use of Stains in Microscopy.—C. E. M'Clung.

Microscopy.—L. Ardery.

Use of Staining Reagents in Microscopy.—W. F. Thomson.

KENTUCKY.

Proceedings of the Fifteenth Annual Meeting of the Kentucky Pharmaceutical Association.—Held at Carrollton, May, 1892. The following papers were read:

The Best Method of Preventing the Growth of Fungi in Alkaloidal Solutions.—J. A. Flexner has found boric acid to be the best.

Adulteration of Beeswax and How to Detect it.—G. Holzhauer.

Is it Advisable or Profitable for the Retail Pharmacist to keep Non-secret Remedies.—R. J. Snyder.

LOUISIANA.

Proceedings of the Tenth Annual Meeting of the Louisiana State Pharmaceutical Association.—Held at New Orleans, April, 1892. Contains reports of the Committees on Legislation and Trade Interests.

MAINE.

Third Annual Meeting of the Maine Pharmaceutical Association.—Held at Harpswell, June 15, 1892.

MASSACHUSETTS.

Proceedings of the Eleventh Annual Meeting of the Massachusetts Pharmaceutical Association.—Held at Springfield, September, 1892. The following papers were read:

Copper in Volatile Oils.—J. A. Tailby.—(Reprinted in Drug. Circ., 1892, 274.)

Granulated Citrate of Magnesium.—W. L. Scoville. E. L. Patch had ten papers on his list, most of them in response to queries; the titles were: "Assay of Blood-Root," "Assay of Lobelia," "Assay of Blaud's Pills," "Color Reagents to be used in the new United States Pharmacopœia (1890)," "Crystalline Precipitate in Fluid Extract of Cimicifuga," "Cicutaconium," illustrated with specimens, "Calcium Lactophosphate," "Compound Extract of Colocynth," "Fluid Extract of Larkspur," and "Lactic Acid." E. L. Patch's paper on the "Color Reagents" attracted special attention. In connection with this subject he explained the different kinds of methyl orange and gave the different results obtained from each with the use of acids.

Model Drug Stores.—Two papers written by ladies. (Drug. Circ.)

MICHIGAN.

Proceedings of the Michigan State Pharmaceutical Association.—The Tenth Annual Meeting. Held at Grand Rapids, August, 1892, contains:

A review of the contributions of the school of Pharmacy of the University of Michigan, for the year 1891–92. By A. B. Prescott.

1. Pharmaceutical Preparations and Methods of Preparation. From the work of eleven students.
2. The Chemistry of Certain Alkaloids.—From six workers.
3. Chemical Analyses of Medicinal Plants. Three contributions.
4. Drug Assays and Methods of Assay. From five contributors.
5. Operative Methods in Analytical Chemistry.—Three reports.

6. Other Contributions from four persons.

Talcum—Its Relative Value as a Filtering Medium.—R. B. Carssow. The author arrives at the following conclusions:

1. That Venetian talcum should not be used for pharmaceutical purposes, as it contains a large per centage of impurities that cannot be removed by any practical method of purification.

2. That no dependence is to be placed upon the so-called purified talcum of the market, as the greater proportion of it is doubtless nothing more than commercial white talcum.

3. That the formula given in the National Formulary answers all the requirements when good French chalk is used.

Chlorodyne and Similar Preparations.—A. B. Stevens. The writer offers the following as forming a perfectly clear solution of about the same medicinal strength as those of the N. F. and Br. Ph. and more nearly resembling the commercial article:

Chloroform	2	fl. oz.
Ether	½	"
Tr. cannabis indica	2	"
Tr. capsicum	1	"
Morphinæ sulph.	18	grs.
Oil of peppermint	16	min.
Acid hydrocyanic dil.	1	fl. oz.
Glycerin	2	"
Water	1	"
Alcohol, enough to make	16	"

Chlorodyne and Similar Preparations.—J. J. Wells and J. M. Klein. The authors, in a table, give the ingredients of the following preparations: N. F. Mistura chloroformi et opii; Br. Pharm., tinctura chloroformi et morphinæ; Philadelphia method; Hungarian phar. chlorodyne; London chlorodyne; Mattbies' formula (chloranodyne); Chandler's formula (chlorodyne); New Remedies, Vol. II., 266 (chlorodyne); New Remedies, Vol. X., 9 (chlorodyne); chlorodyne; chlorodyne, English method; chlorodyne method.

Smilax Pseudo—China—Analysis of Rhizome of.—B. E. Cody. The following results are with 10 grams of the No. 30 powdered rhizome:

	Per cent.
Moisture (possibly a trace of vol. oil)	7.19
Ash	3.53
Ethereal oil.	.05
Fixed oil	.21
Resin total	.31
Alkaloid bambine	.014–.021
Alpha-principle, or a–bambin	3.33
Beta-principle, or b–bambin.	1.25
Tannin.	.885
Insoluble fibre	82.231
	99.000

How to Fit Trusses.—H. G. Coleman.—(Also West. Drug., 1893, 51; Drug. Circ., 1893, 81).

Sulphur Soaps.—J. H. Parsons. Analyses of six commercial varieties of sulphur soap.—(Also West Drug., 1893, 192; Pharm Era, 1892, 294).

Atropine: Its Recovery under Assay Conditions and Liability to Decomposition.—John J. Sheedy. From the author's experiments it seems reasonable to suppose that the great difficulty encountered in entirely freeing the alkaloid from chlorophyll, fat, etc.; the repeated washings necessary and the incomplete extraction in assay and the length of time employed in a laboratory furnish an explanation for the loss of alkaloid.

Morphine Strength of Laudanum as Supplied Generally in the State of Michigan.—E. H. Haag. The author examined forty samples from 12 different cities of Michigan. From two tables which the author gives, it appears:

1. That 23 samples were probably made from gum opium containing 9 per cent. of morphine; in this are included all containing over 2.3 and under 4 grains of morphine to the ounce.

2. Those below this have been made with careless methods or from a low grade quality of opium, or diluted purposely to make the so-called family laudanum.—Also Pharm. Era, 1892, 294.

The Extent to which Alcohol Affects the Digestive Power of Pepsin.—O. H. Soetje.

MINNESOTA.

Proceedings of the Eighth Annual Meeting of the Minnesota State Pharmaceutical Association. Held in Duluth, July, 1892. The following papers were read:

Report of Committee on Fire Insurance.—G. W. Franchere and C. A. Pooler.

Report of Committee on Trade Interests.—J. P. Allen.

Glycerin.—L. A. Harding. A paper on the relation of the animal product to that obtained from the vegetable source. The author concludes that physically and chemically there is no difference and questions any difference.

MISSISSIPPI.

Second Annual Meeting of the Mississippi Pharmaceutical Association.—Held at Jackson, May, 1893. The following papers were read:

The Progress of Pharmacy.—J. C. Schotel.

The Pharmacist's Leisure Hours.—J. C. Schotel.

The Cut Rate Problem.—John P. Mays.

MISSOURI.

Proceedings of the Fourteenth Annual Meeting of the Missouri State Pharmaceutical Association.—Held at Excelsior Springs, June, 1892. The following papers were read:

Report of Committee on Drug Adulteration.—C. C. Hamilton.

Spiritus Ætheris Nitrosi.—C. O. Curtman. The results of very extensive analyses by the author show that by far the greater number of brands of concentrated nitrite of ethyl contained the full percentage (or even more than that) which they were marked to contain, averaging 90 per cent. Regarding the preservation of this article the author suggests that the packing bottles in which it is shipped and stored, should be of the deepest amber-colored glass, and additional protection by opaque wrappers is very desirable. The shelf bottles of the stores, in which the spirit of nitre is kept for dispensing, should also be protected from light as far as possible. Cool storage is very useful, and during the warm season the greater portion of the stock not wanted for immediate use should be kept in a cool, dark place.

The habit of selling concentrated nitrous ether has disadvantages as well as advantages. Among them is the loss of material on opening the bottles, unless they have been reduced to a low temperature ; and the use of alcohol of less than the required strength of purity, containing fusel oil and similar impurities. Regarding the volumetric assay and nitrometric methods the original must be read, which is also to be found reprinted in Pharm. Jour. Trans., 1892, 87 ; Pharm. Review, 1892, 124 ; Nat. Drug., 1892, 27 ; Pharm. Rund., 1892, 156.

Some Things Needed.—J. M. Good.

Sensitive Iodine Preparations.—G. H. C. Klie. Notes on Syrup of Hydriodic Acid, Iodide of Iron, Saccharated Iodide of Iron and Syrup of Iodide of Iron. The author proposes the following formula for Ferri Iodidum Saccharatum :

Iron	6 parts.
Iodine	17 "
Distilled Water	20 "
Pulverized Iron	1 "
Sugar of Milk	79 "

The text should be changed to read as follows :

Transfer the mass quickly to a heated iron mortar, containing the Pulverized Iron, and the remainder of the Sugar of Milk and reduce the whole to powder.

The product will not exhibit the same color as heretofore. It can be dissolved in water, filtered, and the syrup of iodide of iron can be made extemporaneously if desired. Saccharated iodide of iron, which exhibits free iodine, can be restored to its pristine condition by the addition of one per cent. or q. s. of pulverized iron. (See Nat. Drug., 1892, 127).

Practical Pharmaceutical Notes.—F. Hemm. The author concludes, from long experience, that Lake's modification in the preparation of ferri phosphas and ferri pyrophosphas is a good one and much more successful than the Pharmacopœial preparation.

Ferri et Ammonii Tartras.—The author endorses Prof. Power's formula and gives a similar one for the preparation of this salt. He also is convinced that the quantity of tartaric acid in the officinal formula is, as has been stated by Oldberg, just three times as large as it should be.

Unguentum Hydrargyri Nitratis.—In the preparation of this ointment after the acid has been added as directed the heat should be carefully raised above 70° C., until effervescence becomes well established; then maintain, as nearly as possible, this degree of heat, and continue it until the reaction ceases. Now allow to cool to about 45° C., and having dissolved the mercury in the remainder of the nitric acid and while the solution is still warm or if it has cooled, warm it on a water-bath, mix with the base and thoroughly incorporate with a wooden or horn spatula. If the mercury solution be added to the base while too hot, the ointment will become discolored, due to the reduction of the mercuric nitrate, and if the base has become too cool the mercuric nitrate will separate in the form of granular pieces.

Chloroformum Purificatum.—The examination of two popular brands showed that they came up fully to pharmacopœial requirements for purity. (See Nat. Drug., 1892, 69).

What Shall the Standard be?—Walker Evans.

Pilulæ Catharticæ Compositæ.—G. H. C. Klie. The author prepares and selects the compound extracts of colocynth and abstract of jalap. He prefers gelatin to sugar coating of the pills.—(See Nat. Drug., 1892, 91).

Qualitative Examination of Baking Powders.—C. C. Hamilton.—(See Nat. Drug., 1892, 112).

Applied Pharmacy.—W. Mittelbach.—(See Nat. Drug., 1892, 70; Drug. Circ., 1892, 259).

Triticum repens, Linn.—J. C. Erk. The preparation of the fluid extract and its uses.—(See Nat. Drug., 1892, 112).

MONTANA.

The Second Annual Meeting of the Montana State Pharmaceutical Association.—Held at Butte, August, 1892. There was a discussion of the proposed Pharmacy law; (See Meyer Bros. Drug., 1892, 323); also an informal discussion of the morphine law.

NEBRASKA.

Eleventh Annual Meeting of the Nebraska Pharmaceutical Association.—Held at Grand Island, June, 1892. The following papers were read:

Druggist or Pharmacist.—M. E. Schultz.

Characteristics of a Model Drug Clerk.—E. Bexton.

Counter Prescribing.—H. R. Gering.

What is the Use of Joining the State Pharmaceutical Association?—H. T. Hicks.

Keratin-coated Tape-worm Pills.—C. Dummer proposes a formula. See West Drug., 1892, 329.

NEW HAMPSHIRE.

Proceedings of the Nineteenth Annual Meeting of the New Hampshire Pharmaceutical Association.—Held at Keene, Sept., 1892. The following papers were read:

Report on the Progress of Pharmacy.—C. M. Morse, pages 23–35.

A Pure Cigar.—W. P. Underhill.

NEW JERSEY.

Proceedings of the Twenty-Second Annual Meeting of the New Jersey Pharmaceutical Association.—Held in Plainfield, N. J., May, 1892. The following papers were read:

Report on Trade Interest.—Abbott L. Avery.

Should not every state amend its pharmacy law so that all persons desiring to establish drug stores within its limits be compelled to successfully pass the examination of the state board, whether or not the applicant be a graduate of pharmacy?—H. J. Lohman.

Linimentum Ammoniæ.—H. J. Lohman.

Water of ammonia	4½ oz.
Cotton seed oil	9½ oz.
Neats' foot oil, enough to make	1 pt.

Mix the oils and heat on sand bath to about 100° F. Heat water of ammonia in well-stoppered vessel and mix with the two other liquids while hot. Complete saponification will follow almost instantaneously.

Ferments.—Mr. Kilmer. A demonstration of the action of ferments on foods.

Should Druggists Advertise?—W. C. Alpers.

Local Organization.—P. W. Bedford.

What is the best process for making benzoated lard?—P. E. Hommel.

Would not chemical symbols in addition to the official titles be advantageous on the labels of the shelf bottles?—P. E. Hommel.

Is the Addition of Ethereal Oil to Compound Spirit of Ether Desirable?—P. E. Hommel replies that spiritus etheris compositus should be simplified by preparing it thus:

Stronger ether	40 parts.
Alcohol	60 parts.

The ethereal oil would thus be replaced by its equivalent quantity of ether and a uniform and stable article would be obtained. This would give a preparation similar to the spiritus etheris of the British Pharmacopœia. The German Pharmacopœia has 1 part of ether and 3 parts of alcohol. The French Codex equal parts of ether and alcohol. In these

countries this preparation is employed as a simplified form of Hoffmann's anodyne. England, Germany and France get along very well without "oleum ethereum." (See *Spiritus Aetheris*, U. S. P.)

Qualitative Examination of Drinking Water.—H. P. Reynolds.

NEW YORK.

Proceedings of the Fourteenth Annual Meeting of the New York State Pharmaceutical Association.—Held at Syracuse, May, 1892. Contains the following:

Report on Adulteration.—By R. G. Eccles. Examination of diluted acetic acid, brandy, purified chloroform, compound spirit of ether, spirit of nitrous ether, stronger ether, dilute hydrobromic acid, dilute hydrochloric acid, dilute hydrocyanic acid, diluted nitric acid, tincture of nux vomica, bromide of potassium, saffron, seidlitz powders, bromide of sodium, precipitated sulphur, washed sulphur, diluted sulphuric acid, whiskey, alum, creosote, tincture of aconite, syrup of iodide of iron, saccharated pepsin, asafetida, tincture of iodine, caustic potash, fluid extract of wild cherry and fluid extract of ipecac. (See Drug. Circ., 1892, 147.)

Report on New Remedies—By G. B. Wray, Chairman. An account of the origin, preparation, solution and doses of about 86 new remedies.

NORTH CAROLINA.

Proceedings of the Thirteenth Annual Meeting of the North Carolina Pharmaceutical Association.—Held in Raleigh, Aug., 1892. The following papers were read:

Compound Syrup of Hypophosphites, N. F., 370.—H. T. Hicks. For a stock syrup, the author says precipitation may be prevented by using pure materials, freshly made. A definite amount of strychnine should take the place of the tincture of nux vomica. He proposes the following:

Hypophosphite of calcium	256 grains.
Hypophosphite of potassium	128 grains.
Hypophosphite of sodium	128 grains.
Hypophosphite of manganese	16 grains.
Solution of hypophosphite of iron	96 minims.
Hydrochlorate of quinine	8 grains.
Hydrochlorate of strychnine	1 grain.
Sugar	14 oz. (av.)
Distilled water, enough to make	1 pint.

Dissolve the calcium salt in four and one-half ounces of water, the potassium and the sodium salts in one ounce, the manganese salt in one ounce and the strychnine salt in half ounce. Rub the quinine salt with the sugar and introduce into a graduated bottle; add all the solutions except the iron and agitate till the sugar is dissolved or nearly so, then add the iron solution and enough water to make one pint. Shake well and set aside for ten days and filter through paper.

The water used in the above work should be either freshly distilled or boiled just previous to being used.

Apparatus for Dispensing Lime Water.—H. T. Hicks. The author has figured and described an apparatus for obtaining the medium layer of liquid. It consists of a suitable container, to which is fitted a cork having two holes to carry glass tubing about 7 m.m. diameter. Next select a piece of annealed glass tubing of above size and long enough to reach from top of cork to bottom of container; bend the tube at right angles about 2 c.m. from one end and draw it into a bell-shape or fuse it to a very small funnel. Pass the straight end through one of the holes in the cork, having it project 3 c.m. or more above. Pass through the other hole a glass tube about 10 c.m. long, leaving the ends of about equal length.

To arrest the passage of carbon dioxide of the air into the apparatus, some modification of the potassium-bulb may be substituted for the short tube.

Tie a piece of muslin over the bell or funnel end of long tube and attach to other end a piece of rubber tubing of suitable length for a syphon. Close the free end of rubber tube with a pinch-cock.

A convenient support may be made for the bend of the syphon from a piece of stiff wire stuck firmly into the cork and given the proper curve; the rubber syphon is held to this by two small rubber bands.

Some of the Points to be Taken into Consideration by a Young Man Contemplating the Study of Pharmacy.—F. A. Bobbit.

Criticisms of Beef, Iron and Wine as Prepared by Existing Formulas.—W. H. Wearn. A permanent preparation cannot be made without using detannated sherry wine. Hydrated peroxide of iron is the best detannating agent to be used. He proposes the following formula as making a superior product to the N. F. formula:

Extract of beef	256 grains.
Phosphate of iron	32 "
Water	1 fl. ounce.
Syrup	2 "
Tinct. aurantii recentis, (20 per cent.)	1 "
Sherry wine, q. s.	1 pint.
Hydrated peroxide of iron	2 ounces.

Mix hydrated peroxide of iron with tincture of orange and sherry wine and allow to stand 24 hours, agitating occasionally. Filter and test for absence of tannin with tincture of chloride of iron. If free from tannin add beef and iron, previously dissolved.

Elixir of Paraldehyd.—W. H. Wearn.

Absolute paraldehyd	3 fl. ounces.
Alcohol	10 fl. ounces.
Syrup	10 "
Orange Flower Water	4 "
Water	2 pints.
Caramel, q. s., to color	5 minims.

Mix.

This formula produces a preparation identical with that of Robinson's, the popular proprietary elixir.

The Assay of Alkaloidal Drugs and Galenical Preparations.—Chas. Caspari.

Condenser—An Upright.—S. J. Hinsdale. The reservoir has a capacity of one gallon. The tin case holding the glass conveying tube is 12 inches long, 4½ inches diameter at the top and 3 inches diameter at the bottom. The glass condenser inclosed is made of thin glass tubing of 1½ inches diameter. It is 10 inches long and is drawn out at each end to tubes of ¼ inch inside diameter. The upper end is curved so as to be adjusted to the rubber tube from the flask. The rubber tube from the reservoir connects with a glass tube which goes nearly to the bottom of the tin case, and is furnished with a pinch-cock. The rubber tube connected with the top of the tin case carries off the warm water. This tube may be passed through a hole in the table into a bucket. The glass tube connected with this rubber tube should be a little larger than the glass tube which supplies the cold water. Pressure on the pinch-cock supplies the tin with cold

FIG. 58.

Hinsdale's Upright Condenser.

water while the warm water runs off. Ice water may be used in the reservoir if desired. The inside of the tin case is covered with shellac varnish.

Where there is a water supply and a supply of gas the reservoir and the lamp may be dispensed with.

Comments on Several Queries.—William Niestlie. 1. Deod. tr. opii, U. S. P., precipitates a large proportion of its extracted matter upon standing. What is the cause and nature of this precipitate? 2. Does the U. S. P. formula for aromatic spirit of ammonia produce a satisfactory product of required strength and pharmaceutical elegance? 3. A few formulas for creasote pills.

NORTH DAKOTA.

Proceedings of the Seventh Annual Meeting of the North Dakota Pharmaceutical Association.—Held in Fargo, August, 1892. Including also the sixth annual report of the North Dakota State Board of Pharmacy. The following paper was read:

Laboratory Notes.—A. I. Widlund. The author gives the following method for preparing *Medicinal Waters:*

(Any volatile oil)	4 C.c.
White filter paper (c. p.)	20 Gm.
Boiling water	2 litres.

Distribute the oil over the surface of the paper, drop by drop, then fold together several times and press firmly, then tear into shreds and transfer to a flask and add boiling water in portions, shaking thoroughly between each addition until a perfect pulp has formed. When cold, filter, adding sufficient distilled water to make two litres. This makes a good general formula subject to such alterations as the circumstances may require.

For preserving mucilage of acacia the author uses 50 per cent. of lime water in the water used to dissolve the gum.

OHIO.

Proceedings of the Fourteenth Annual Meeting of the Ohio State Pharmaceutical Association.—Held at Canton, June, 1892. Containing the following:

Eighth Annual Report of the Ohio Board of Pharmacy.

Position of Organic Chemistry as Applied to Science.—E. A. Schubert.

College vs. Store Education.

PENNSYLVANIA.

Proceedings of the Fifteenth Annual Meeting of the Pennsylvanial Pharmaceutical Association.—Held at Susquehanna Heights, June, 1892. The following papers were read:

Original Papers at the Meetings of State Pharmaceutical Associations.—W. H. Reed.

Examinations by Boards of Pharmacy.—J. P. Remington. An answer to the question as "What should be the true aim of Boards of Pharmacy in their examinations, and what should be the nature of the questions? Reprinted in Amer. Jour. Pharm., 1892, 355–357.

Is the Retail Druggist Losing his Identity as a Professional Man?—J. H. Redsecker.

Solubility of Asafetida in Alcohol.—G. W. Kennedy examined 10 commercial specimens and found the per cent. soluble in alcohol to range between 29.25 and 68.80.

Does it pay the Retail Druggist to Manufacture Compressed Tablets, Tablet Triturates, etc.? What advantage, if any, has the tablet over the pilular form of medicine? What is the solubility in comparison with gelatin or other coated pills? Can the physician rely on its prompt action?—These were combined into one query and replied to by J. H. Hahn.

Infusion of Digitalis.—J. W. England. (See Infusa.)

Patents or Proprietary Goods of a certain class are growing in numbers, and are advertised among physicians extensively, and prescribed by them to a considerable extent. Most of them are very expensive, and prices must be charged for them that the laity think are excessive, due to exorbitant cost to the druggist. Should physicians and druggists encourage the sale of these nostrums? Answered by Louis Emanuel.

Remarks on Some Drugs.—J. M. Maisch considered Polygala alba and Senna. He exhibited specimens of Aden senna, which has made its way into Europe, and is likely to come to this country, and he thought that it has appeared as an admixture of the so-called Alexandria senna.

Saccharum Lactis.—A. J. Tafel.

Syrup of Yerba Santa.—J. H. Hahn.

Fld. ext. yerba santa	℥ iiiss.
Carb. magnesia	℥ ii.
Glycerin	℥ viii.
Sugar (granulated)	℥ civ.
Water, q. s.	Oviii.

Rub the fluid extract with the carb. of magnesia and eight ounces of sugar, add three pints of water and allow the mixture to stand for 36 hours, stirring occasionally. Place the sugar in a graduated bottle and add the glycerin thereto; filter the above solution directly into the sugar and glycerin, and add enough water through the filter to make the whole measure eight pints; dissolve the sugar by agitation, without heat and strain.

Asepsis and Antisepsis—From a Pharmacist's Standpoint.—J. J. Edmondson.

How can the Retail Druggist be relieved of the burden of keeping so many Proprietary Medicines?—John F. Patton. (See also Pharm. Review, 1892, 182; West. Drug., 1893, 99.)

Spices—An Essay on the Selection of.—C. A. Heinitsh says that at the present time the plantation or cultivated spices, grown on the Penang or Prince of Wales Islands, lying at the mouth of the Straits of Malacca, such

as cloves, nutmegs, mace, etc., are the finest; these are selected at the place of their growth, and afterwards hand-picked in London, except cloves, which are cultivated in a distinct class, from finest Penang to commercial Zanzibar, the Amboyna and Bencoolen being intermediate grades.

The nutmegs are unlimed and very large, from 50 to 60 to a pound, rich in oil.

The mace has the bright, orange-yellow color, rich in fixed oil and aroma, the arils being very perfect.

Peppers, the Malabar, Singapore and Tellicherry, black and white full developed, heavy fruit, well cleansed by sifting and washing, and known as shot pepper, possess the greatest amount of pungency and fine aroma; also the largest amount of piperin and oil.

The Malabar black is a special production, but expensive. Ground Malabar is of an exceptionally fine flavor and pungency.

Capsicum.—The African is unequalled for quality; this kind is best for making tincture and fluid extract.

Pimento.—The small well developed is richer in oil.

Gingers.—The Jamaica, Cochin-China, bleached and unbleached, are used more for medicinal purposes. The African, in its natural state, is used for culinary purposes. It is now conceded that rhizomes cultivated at the Missions, and by other special growers, possess a finer aroma and strength than the wild or East India ginger.

Mustards.—The fine blends of English and Trieste, or Kentucky grown seed, are the desirable ones and equal to any foreign brands of English, Russian or German.

The Cassia, commonly called Cinnamon, known as Saigon, coming from Cochin-China, possesses a different and superior aroma and strength to the ordinary Chinese. The young thin bark is the kind to select from to supply a trade demand for a lower priced article.—(Reprinted in Am. Jour. Pharm., 1892, 357–360.)

RHODE ISLAND.

Proceedings of the Annual Meeting of the Rhode Island Pharmaceutical Association.—Held at Providence, January, 1893. The following paper was read:

Pharmaceutical Notes and Queries.—C. E. Greene dealt with the chemistry of various incompatible mixtures. (See also Pharm. Record, 1893, 62.)

SOUTH CAROLINA.

Annual Meeting of the South Carolina Pharmaceutical Association.—Held at Charleston, November, 1892.

SOUTH DAKOTA.

Proceedings of the Seventh Annual Meeting of the South Dakota Pharmaceutical Association.—Held at Sioux Falls, August, 1892. The following papers were read:

The Good of the Order.—R. Upson.

How may a Pharmaceutical Education be made practical?—C. C. Maxwell.

What is the Metric System and its Advantages over the Apothecaries' System, if any?—A. A. Stites.

Alcohol and its allied Bodies.—C. F. Ayer.

Iron Preparations of U. S. P.—A. H. Keller.

Random Notes on the Every Day Expenses of the Retail Pharmacist.—N. C. Hall.

A Plea for Better Education in Pharmacy.—J. H. Shepard.

What Recognition, if any, should be given to Certificates Issued by Boards of Pharmacy of other States?—W. S. Branch.

Is it mutually advantageous to the Public and to the Profession of Pharmacy, to maintain a State Board of Pharmacy and Pharmaceutical Association? If so, How May Best Results be Obtained?—I. A. Keith.

TENNESSEE.

Proceedings of the Eighth Annual Meeting of the Tennessee Druggists' Association.—Held at Nashville, Tenn., 1893. The following papers were read:

Should Druggists test Medicines bought from the Wholesaler?—E. A. Ruddiman.

The Comparison of Pharmacy Laws of the Southern States.—Mr. Bradley.

TEXAS.

Proceedings of the Fourteenth Annual Meeting of the Texas State Pharmaceutical Association.—Held at Dallas, May, 1893. The following papers were read.

Should the Pharmacist give the Physician a Percentage on Prescriptions under any Circumstances. If so, what?—M. P. Long, W. R. Neville, J. M. Brooks, H. L. Carleton.

The Best Method of conducting a Retail Pharmacy.—J. M. Brooks.

The Best Manner in which to overcome the illegitimate sale of Drugs and Patent Medicines in Department Stores.—H. L. Carleton.

Home Study as a substitute for those not able to attend College.—H. L. Carleton.

Best Method of preparing and preserving the Official Syrups in Southern Climates.—A report upon syrup of ipecac and syrup of wild cherry. The author finds the best method of preserving syrups in Southern climates is by the replacement or addition of 5 to 10 per cent. of glycerin, and keep the syrups in 3 to 4 ounce bottles, well corked and excluded from the light, and in a cool place.—M. S. G.

——— W. R. Neville in making syrup of senega from an infusion clarifies

the latter by the white of an egg. To syrup of wild cherry an excess of glycerin is added and one per cent. of boric acid.

In making Spirit of Nitrous Ether, should the concentrated be used?—M. S. G.

Is the Soda Fountain profitable to the Drug Business?—W. F. Shook.

Infusions.—W. E. Greiner.

Why should not Medicated Waters be made by the United States Pharmacopœia Process?—L. Myers Connor recommends magnesium carbonate.

The Best Method of Conducting a Retail Pharmacy.—R. H. Bingham.

How to Conduct a Retail Drug Store.—H. C. Whitney.

The Best Method of Home Study.—W. R. Neville.

VIRGINIA.

Proceedings of the Eleventh Annual Meeting of the Virginia Pharmaceutical Association.—Held at Petersburg, Oct., 1892. The following papers were read:

The Relations existing between the Pharmacist and the Community.—T. Roberts Baker. Showing the important services performed for the community by the pharmacists.

——— W. S. Alfriend. Showing the dependence of the community on the pharmacists for services of the greatest importance.

Chemical Force in its Relation to Other Forms of Energy.—Hugh Blair.

The Hypophosphites: their Chemistry and Therapeutics.—Hugh Blair.

French in Commerce.—W. A. Strother. A paper on the adoption of the metric system in commerce.

WASHINGTON.

Proceedings of the Third Annual Meeting of the Washington State Pharmaceutical Association.—Held at Seattle, May, 1892. Containing the first annual report of the Washington State Board of Pharmacy.

WISCONSIN.

Proceedings of the Thirteenth Annual Meeting of the Wisconsin Pharmaceutical Association.—Held at Oshkosh, August, 1892. The following papers were read:

Woman in Pharmacy—R. Sauerhering.

To what extent is White Wax adulterated with Paraffin?—A. Conrath. Eight out of twelve samples examined by the author were so adulterated.

Examination of Commercial Saffron and the extent to which Carthamus is substituted for it.—R. Sauerhering.

What Proportion of the Pharmacists of this State make use of the U. S. Pharmacopœia and the National Formulary.—E. B. Heimstreet sent out a thousand slips to pharmacists of the State concerning this query. To these inquiries the author received 508 replies. 152 replied that they used

both works constantly. 345 used the U. S. Pharmacopœia, but not the Formulary, and 11 answered they did not use either.

Does the Mercurial Ointment of Commerce contain the required amount of Mercury?—C. R. Bechman. The author gives his method of assay, and records the range of 50 per cent. ointment as containing from 43.75 to 49.2 per cent. of mercury. The 33 per cent. ointment contained from 31.5 to 33.3 per cent.

Does the Commercial Citrate of Iron and Quinine contain the required amount of Alkaloids?—H. C. Schranck answers, yes.

Some Statistics of the Vegetable Drugs collected in this State and the amount collected annually.— H. Huber.

Examination and Report on the Official Solution of Ferric Chloride as found in Retail and supplied by Wholesale Stores.—H. G. Ruenzel examined 12 samples; the work recorded was done in the following order: 1. Specific Gravity; 2. Test for ferrous salt; 3. Test for free nitric acid; 4. Test for free hydrochloric acid; 5. Percentage of ferric chloride; 6. Test for zinc, copper and fixed alkalies.

Theses from the School of Pharmacy of the University of Wisconsin Examination of the Resin of Canada Balsam.—H. A. Peters.

Burgundy Pitch.—W. G. Kuntz.

Examination of Oleum Hedeomæ.—W. C. F. Witte.

Examination of Certain Fractions of Oil of Hedeoma.—L. C. Urban.

Citronellon.—L. A. Urban.

Citronellic Acid.—Clara Abbott.

Notes on Pinene.—L. H. Kressin.

Pinol Hydrate.—E. W. Smith.

Carvol.—C. B. Raymond. A summary of the work.

Inner Bark of Fraxinus americana—Examination of.—R. H. Mieding.

Notes on Benzylidine Dipiperidine.—C. F. Tomkins.

Mixed Halides of Lead.—H. A. Brennecke.

NEW REMEDIES.

Commercial Names of New Remedies.—Pharm. Centralh., 1892, 654 and 727.

Acidum Asepticum or Aseptinicum—A mixture of a solution of peroxide of hydrogen with boric and salicylic acids.

Adeps Lanæ—Purified wool fat.

Agathin—Salicyl-a-methylphenylhydrazone.

Alexin—A generic name for the protective albuminous preparations used for inoculations, such as "tuberculocidin" of Alexine T. C.

Alumnol—Aluminum naphtholsulphonate.

Amidol—Diamidophenol (for photographic purposes).

Analgen—Ortho-ethoxy-ana-monobenzoylamido-chinolin.

Analgesin—Antipyrin.

Anaspalin—An ointment similar to lanolin.

Angioneurosin—Nitroglycerin.

Annidalin—Aristol.

Anodynin—Antipyrine.

Anthrarobin—Leuco-alizarin.

Anticholerin—A product of the cholera bacteria prepared according to Klebs.

Antifebrin—Acetanilid.

Antikol—A mixture of acetanilid, sodium bicarbonate and tartaric acid.

Antimyceton—Sodium chloroborosum.

Antinervin—Mixture of acetanlid, ammonium bromide and salicylic acid.

Antinonnin—Potassium orthodinitrocresol with soap and glycerin.

Antipyrin—Phenyldimethylpyrazolone.

Antisepsin—Mixture of the iodide and sulphate of zinc with boracic acid and thymol.

Antiseptol—Iodosulphate of cinchonine.

Antithermin—Phenylhydrazine-laevulinic acid.

Aristol—Dithymoldiodide.

Asaprol—Calcium salt of β-naphthol-α-monosulphonic acid.

Asbolin—Alcoholic distillate of soot.

Aseptic Acid—Acidum asepticum.

Aseptol—Sozolic acid.

Azurin—Cuprammonium sulphate (used against plant-lice).

Barmenit—Sodium chloroborosum.

Benzalagen—Analgen (which see).

Benzonaphthol—β-naphthyl benzoic ether.

Benzo-Phenoneid—Tetramethyldiamido-benzo-phenoid (?).

Benzosol—Guaiacol benzoate.

Betol—β-naphthyl salicylate.

Boro-Boracic Acid—Mixture of equal parts of boric acid and borax.

Borol—Fused mixture of boric acid and sodium bisulphate.

Bromol—Tribromophenol.

Bromophtarin—A disinfectant. Composition not known.

Bromopyrin—Mixture of caffein, antipyrin and sodium bromide.

Caffeoresorcin—Combination of caffeine and resorcin.

Cancroin—Extract of cancerous tumors, according to Adamkiewicz.

Chlorobrom—Solution of potassium bromide and chloralamid in water.

Christia—Manilla paper made water proof with chrome gelatin.

Creolin—Mixture of coal tar hydrocarbons (see also under K) and resin soap (*Pearson's*); mixture of coal tar hydrocarbons with cresolsulphonic acid (Artmann's creolin).

Cresalol—Salicylate of paracresol.

Cresolin—A preparation similar to creolin.

Cresylol—Cresol.

Dermatol—Basic bismuth gallate.

Desinfectol—A product somewhat similar to creolin.

Diaphtherin—Oxychinaseptol, an addition product of two molecules of oxychinoline and one molecule of orthophenolsulphonic acid.

Dithione—Mixture of the sodium salts of the isomers of dithiosalicylic acid.

Diuretin—(I. and II.) Theobromine sodium salicylate.

Dulcin—Paraphenetolcarbamide.

Eikonogen—Sodium salt of the amido-β-naphthol-β-monosulphonic acid (for photographic purposes).

Enterokresol—Probably a kresol preparation. Composition unknown. Used by Hiller against cholera.

Epidermine—Basis for ointments, consisting of wax, water, gum and glycerin.

Eucalyptoresorcin—Combination of eucalyptol and resorcin.

Euphorin—Phenyl-urethane.

Europhen—Isobutylorthocresoliodide.

Exalgin—Methylacetanilid.

Exodyn—Mixture of acetanilid, sodium salicylate, and sodium bicarbonate.

Formol—Formaldehyde.

Fossilin—Petrolatum.

Gallacetophenone—Methylketotrioxybenzole.

Gelatol—Ointment basis, consisting of oil, glycerin, gelatin, and water.

Glacialin—Mixture of borax, boric acid, and sugar (or glycerin).

Glonoin—Nitroglycerin.

Glusidum—Saccharin.

Guaiacolsalol—Salicylate of guaiacol.

Glycogelatin—A mixture of glycerin and gelatin for ointments.

Glycozon—A solution of ozone in glycerin, prepared under pressure.

Hæmatogen—Albuminate of iron.

Hæmogallol—Produced by the action of pyrogallol upon the coloring matter of blood (hæmatin).

Hæmol—Produced by the action of zinc dust upon the coloring matter of blood.

Hydracetin—Acetophenylhydrazine.

Hypnal—Chloralantipyrin.

Hypnone—Acetophenone.

Ichthyol—Ammonium salt of ichthyol-sulphonic acid.

Ingluvin—Pepsin obtained from the crop of chickens.

Iodol—Pyrrol tetraiodide.

Iodophenin—Iodine combination of phenacetine.

Iodopyrin—Iodoantipyrine.

Kairin A—Oxychinolinethyl hydrochloride.

Kairin M—Oxychinolinmethyl hydrochloride.

Kochin—Tuberculin.

Kreolin—See Creolin.

Kresalol—See Cresalol.

Kresin—A solution of kresol in a solution of sodium cresoxyl acetate.

Kresolin—See Cresolin.

Kresylol—See Cresylol.

Lanesin—A preparation similar to lanolin.

Lanolin—Purified wool fat emulsified with water.

Lipanin—An olive oil containing 6 per cent. of free oleic acid.

Losophan—Triiodometacresol.

Lysol—Mixture of soap with cresols.

Mallein—A product of the "epizootic" bacilli prepared by Adamkiewicz.

Methacetine—Paraacetanisidine.

Methonal—Dimethylsulphondimethylmethane.

Methylal—Methylenedimethyl ether.

Methylanilid—Methylacetanilid.

Metol—Salt of monomethyl paraamidometacresol (for photographic purposes.)

Metozin—Antipyrine.

Microcidin—Sodium β-naphthol.

Mollin—Ointment basis consisting of a glycerin soap containing an excess of fat or oil.

Mollisin—Ointment basis of 4 parts paraffin oil and 1 part of yellow wax.

Myrrholin—Solution of myrrh resin in castor oil.

Naphthalol—Betol.

Naphthopyrin—Combination of β-naphthol with antipyrine.

Naphthosalol—Betol.

Nico—Nickel carbonmonoxide.

Oesipus—Impure wool fat.

Orexin—Phenyldihydrochinazoline hydrochloride.

Orthine—Orthohydrazineparaoxybenzoic acid.

Oxychinaseptol—Orthophenolsulphonate of oxychinoline.

Parodyn—Antipyrine.

Pasta Cerata—Ointment basis consisting of yellow wax, water and potassium carbonate.

Pental—Trimethylethylene.

Phenacetin—Paracetophenetidine.

Phenazone—Antipyrin.

Phenin—Paraacetophenetidine.

Phenocoll—Amidoacetoparaphenetidine.

Phenolid—Mixture of acetanilid and sodium salicylate.

Phenolin—Mixture of soap with cresols.

Phenopyrin—Combination of carbolic acid and antipyrin.

Phenosalyl—Mixture of carbolic acid, salicylic acid, lactic acid and menthol.

Phenylone—Antipyrin.

Picrol—Diodoresorcinmonosulphonic acid.

Picropyrin—Combination of picric acid with antipyrin.

Piperazine—Diethylenediamine.

Piperazidine—Piperazine.

"*Plasment*"—A slimy solution of Irish and Iceland moss with admixture of glycerin and benzoic acid. Basis for urethral injections.

Polysolve—Solvin (which see).

Pyoktanin, blue—Methylviolet.

Pyoktanin, yellow—Auramine.

Pyrazin—Antipyrin.

Pyrazolon—Antipyrin.

Pyretin—A new antipyretic of unknown (?) composition.

Pyrodine—Acetophenylhydrazine.

Pyrogallopyrin—Combination of pyrogallol with antipyrin.

Pyrozone—A 50 per cent. solution of peroxide of hydrogen in ether.

Quickin—A solution of 1 part of carbolic acid, 0.02 mercuric chloride, in 100 parts dilute alcohol.

Quinole—Hydroquinone (for photographic purposes).

Resorcinol—A melted mixture of equal parts of resorcin and iodoform. Name also used for resorcin.

Resorcinopyrin—Combination of resorcin and antipyrin.

Retinole—Rosin oil.

Rodinal—Paraamidophenol (for photographic purposes).

Rotterin—A solution of chloride and sulphocarbolate of zinc, āā 1.25 grams; salicylic acid, 0.3 gram; boric acid, 1.0 gram; citric acid, 0.05 gram; thymol, 0.1 gram; sodium chloride, 0.12 gram in 1 liter of water. The pastilles contain one-quarter of the amount of the above substances, and for use are dissolved in ¼ liter of water.

Saccharine—Orthosulphamidobenzoic anhydride.

Salbromalide—Antinervine.

Salinapthol—Betol.

Saliphene—Salicylphenetidine.

Salipyrin—Antipyrinsalicylate.

Salol—Phenyl salicylate.

Salophene—Acetylparaamidosalol.

Sapocarbol—Mixture of cresols and soap.

Saprol—Mixture of crude cresols with hydrocarbons.

Sedatin—Antipyrine.

Sedox—A dressing for wounds, similar to cotton.

Solutol—Solution of cresols in sodium cresolate.

Solveol—Solution of cresols in sodium cresotate.

Solvin—Ammonium or sodium salts of sulphoricinoleate.

Somnal—Solution of chloral hydrate and urethane in alcohol.

Sozal—Aluminum salt of paraphenolsulphonic acid.

Sozoiodol—Easily soluble. Sodium salt of diiodoparaphenolsulphonic acid.

Sozoiodol—Difficultly soluble. Potassium salt of diiodoparaphenolsulphonic acid.

Sozoiodol Mercury—*Sozoiodol Zinc*—The respective salts of diiodoparaphenolsulphonic acid.

Sozoiodolic Acid—Diiodoparaphenolsulphonic acid.

Sozolic Acid—Orthophenolsulphonic acid.

Spermine—An aqueous infusion obtained from the prostrate gland and testicles of animals.

Styracol—Guaiacol cinnamate.

Styrone—Cinnamyl alcohol.

Sulfaminole—Thio-oxydiphenylamine.

Sulfonal—Diethylsulfonedimethylmethane.

Tetronal—Diethylsulfonediethylmethane.

Thallin—Tetrahydroparachinanisol.

Thermin—Tetrahydro-β-naphthylamine.

Thilanin—Sulphurated lanolin.

Thiol—The ammonium salt of thiosulphonic acid.

Thiolin—Salts of thiolinic acid.

Thiolinic Acid—Sulphurated and sulphonated linseed oil.

Thymacetin—Oxethylacetamidothymol.

Thymotol—Aristol.

Tolypyrin—Para-Tolyldimethylpyrazolon.

Tolysal—Para-Tolydimethylpyrazolon salicylate.

Tonquinol—Trinitroisobutyltoluol.

Trefusia—Natural albuminate of iron.

Trional—Triethylsulphonmethylethylmethane.

Tuberculin—A product of the tubercle bacilli, according to Koch.

Tuberculocidin (shortened T. C.)—Tuberculin purified by removal of certain substances precipitable by platinum chloride, according to Klebs.

Tuberculocidin E.—Mixture of the tuberculin (Koch) and tuberculocidin (Klebs), according to Spengler.

Tumenol—A preparation of tumenolsulphonic acid.

Tumenol powder—A preparation of tumenolsulphonic acid.

Tumenolsulphonic Acid—Obtained by treating the distillate of a mineral oil with sulphuric acid.

Unguentum Myrrhæ—Mixture of 1 myrrh, 10 wax, melted together with oil, and used as a basis for ointments.

Uraline—Chloralurethane.

Zinkhæmole—Obtained by treating hæmatin with zinc dust.

Synthetic Remedies—Solubility in Benzol.—According to Van Eyk (1891, No. 12 *Nederland. Tijdschr.*) the following quantities of benzole are required to respectively dissolve one part of the following remedies: Antifebrin, 100.0; antipyrin, 5.5; betol or naphtosalol, 3.5; iodol, 30.0; methacetin, 180.0; naphtalin, 2.32; β-naphtol, 30.0; phenacetin, 358.0; resorcin, 268.0; saccharin, 607.0; salol, 0.35.—Rep. de Pharm., 1893, 28.

Antipyretics — Synonyms of Popular.—Antipyrin: Phenyl-dimethyl-pyrazolon. Phenyl-dimethylisopyrazolon. Oxydimethyl-chinizin. Dimethyl-oxychinizin. Analgesin. Anodynin. Parodyn. Sedatin. Metozin. Phenylon. Pyracin. Pyrazolon. Phenazon.—*Antifebrin:* Acetanilid. Phenylacetamide. Acetylphenyl-amine.—*Exalgin:* Methyl-phenyl-acetamide. Methyl-acetanilid. Ortho-methyl-acetanilid. Methanilid. Methyl-antifebrin.—*Methacetin:* Para-acet-anisidin. Acet-para-anisidin. Para-oxymethyl-acetanilid. Methoxy-antifebrin.—*Phenacetin:* Acet-phenetidin. Acetyl-phenetidin. Phenetidin. Phenedin. Oxyethanilid. Para-oxy-ethyl-acetanilid. Oxyethyl-phenyl-acetamide. Para-acet-phenetidin. Acet-para-phenetidin. Para-amido-phenol.—Pharm. Rund., 1892, 258.

What are the Actions, Uses and Dangers of Antipyretic Remedies?—C. R. Illingsworth.—Prov. M. J., Leicester, 1892, 286–290.

How Synthetical Remedies are Constructed.—Chem. and Drug., 1892, 936–938.

Tests for Phenacetin, Methacetin and Hydracetin.—Saturated, aqueous solutions of *phenacetin* and *methacetin*, diluted with an equal volume of chlorine water, upon addition of a few drops of ammonia develop a red or brown color; the color with methacetin develops quicker and is more intense than with phenacetin. The addition of 5 to 10 per cent. quinine sulphate to these substances produces in the test a beautiful blue color; the test succeeds best if about 0.1 Gm. of the mixture be agitated with 5 C.c. water, 8 to 10 drops chlorine water, and lastly, 2 to 3 drops ammonia water be added. Hydracetin with chlorine water gives a yellow color, intensified by the addition of ammonia; in the presence of the quinine sulphate a fine red color results. Other substances like acetanilid and exalgin themselves give no coloration, and in the presence of quinine sulphate give only the green color due to the latter; morphine, which with chlorine water alone or with ammonia, gives a yellow coloration in the presence of quinine sulphate, develops only a green color.—T. Gigli, in Chem. Zeit. (Rep.), 1892, 368.

Phenacetin and Antifebrin—To Distinguish Between.—In Pharm. Zeit.; Meyer Bros. Drug., 1892, 229. Place in a test-tube five grams of a mixture of equal parts diluted nitric acid (Ph. Germ.) and water, and 0.5 gram phenacetin, and heat in boiling water. Pure phenacetin will, under these conditions, dissolve, with the development of some color, but on

cooling will solidify to a yellowish mass, which will not flow out even when the tube is reversed. Antifebrin treated as above will dissolve without color, and on cooling will slowly separate unchanged.

Mixtures of phenacetin and antifebrin will dissolve with a yellowish color, but will not solidify, as is the case with pure phenacetin.

Acetanilide can now be purchased of such purity that the solution in sulphuric acid will stand for hours without showing coloration; one gram boiled with 30 C.c. water and one drop of a permanganate solution added will retain the red color for five minutes. Dried at 105° C., it has the melting point of 114° C.—Pharm. Ztg., 1892, 636, 674; Am. Jour. Pharm., 1892, 615.

Aceto-Ortho-Toluid.—Pharm. Post, 1893, 59. This substance has the formula $C_7H_7NHC_2H_3O$, and occurs in colorless needles, difficultly soluble in cold water, readily soluble in hot water, soluble in alcohol and in ether. The crystals melt at 107° C., boiling point being 296° C. It is a powerful antipyretic.

Acetylamido-salol, or *Acetylamido-phenyl-salicylate*, is recommended as a substitute for salol, since it does not possess the toxic properties of the latter. For the preparation of this ester, nitrophenol salicylate, in alcoholic solution, is reduced to the amido compound by means of tin and hydrochloric acid. It is precipitated from this solution by means of soda, and recrystallized from alcohol or benzol. By dissolving in glacial acetic acid, and adding acetic anhydride or acetyl chloride, acetylamido-salol results. It is sparingly soluble in water. As crystallized from hot alcohol or benzol it occurs in white shining scales, melting at 187° C.—Pharm. Zeit., 1892, 45.

Acid Cinnamic forms white or slightly yellowish-colored leaflets, soluble in alcohol, and melting at 133° C. It is used in tuberculosis, principally in the form of an emulsion, administered subcutaneously.—Merck's Ber., Jan. 1893.

Acid Cresotic - (*Paracresotic Acid*).—An antipyretic in the form of sodium paracresotate administered safely to young adults in as much as 60 grains daily.—Squibb's Ephem., Feb., 1893.

Acidum Glycerino-Phosphoricum—A yellow liquid representing an aqueous solution of glycerin and phosphoric acid.—Merck's Ber., Jan., 1893.

Acidum Glycerino-Boricum—Small, colorless, scaly crystals, soluble in water and alcohol.—Ibid.

Acidum Orthoamidosalicylicum—A whitish gray, amorphous, almost odorless powder, having a not unpleasant, slightly sweetish taste, and is soluble in water, alcohol and ether. Used in the treatment of rheumatism. Ibid.

Acidum Phenylboricum—A white powder, difficultly soluble in cold water.

Phenylboric acid, according to G. Molinari, prevents putrefaction in 0.75 per cent. solution and ammoniacal fermentation of urine in 1 per cent. solution. Used as an antiseptic. It is less toxic than carbolic acid.—Ibid.

Acidum Phenylo-Salicylicum.—A white powder, difficultly soluble in water, more readily in alcohol, ether and glycerin. Well adapted as an antiseptic in the treatment of wounds.—Ibid.

Acidum Thiolinicum—Prepared by sulphonating linseed oil. Thiolinic acid occurs as a dark green, crumbled mass, having a mustard-like odor. It is insoluble in water, soluble in alcohol, and contains 14.2 per cent. of sulphur. Therapeutically the alkali combinations of thiolinic acid are to be used in a manner similar to thiol and ichthyol.—Ibid.

Para-Aethoxyhydracetin, Para-Aethoxyantipyrin and Para-Aethoxysalipyrin.—J. Altschul.—Phar. Centralh., 1892, 397.

Agathine, also called salicylaldehyde-α-methylphenylhydrazone, has been found to give good results in neuralgic and anti-rheumatic conditions in doses of 0.12–0.5 Gm. (2–7 grains) two or three times daily; the action is not immediate, but shows after a few days when 4–6 Gm. have been administered. The compound, when pure, forms small white laminæ, melting at 72° C.; it is insoluble in water, but soluble in alcohol, ether, benzol, ligroin; boiling with concentrated hydrochloric acid decomposes it. The formula is given as $C_6H_4.OH.CH:N.N.CH_3.C_6H_5$; it is made by the Höchster Farbwerke.—(D. Med. Ztg.) Pharm. Ztg., 1892, 414; Am. Jour. Pharm., 1892, 409.

Agopyrin, a new antipyretic used as a specific in influenza, is a mixture of salicin, chloride of ammonium, and cinchonine sulphate.—Pharm. Centralh., 1892, 758.

Alligatorine.—Name proposed for a product obtained from the fat of the Alligator mississipiensis, to be used as an ointment base.—J. Hyatt, Inter. Pharm. Gen. Anz., April, 1893; Rép. de Pharm., 1893, 217.

Alumnol, one of the naphthol-sulphonates of aluminium, is a fine, white, non-hygroscopic powder, easily soluble in cold water; hot water solutions containing 40 or more per cent. can be prepared without separating the salt upon cooling. Alumnol is not quite so soluble in alcohol, the solution showing a beautiful blue fluorescence; it is also soluble in glycerin, but is insoluble in ether. The substance contains 5 per cent. aluminium and 15 per cent. sulphur in form of the sulphonic group. Alumnol possesses reducing proerties as sho wn with silver nitrate; with ferric chloride, even in dilute solution, a blue color results. Upon prolonged exposure alumnol darkens somewhat, but without loss of medicinal virtue. Alumnol solutions precipitate albumen and gelatin, but the precipitates are soluble in excess of these substances, in consequence of which this astringent antiseptic will not cause the clogging up of pus-secreting sores. A special use of the substance in ophthalmical practice is noted by Wolff-

berg, a 4 per cent. solution dropped into the eye arresting the flow of tears for several minutes, thus enabling an easy examination.—Heinz and Liebrecht (Berl. Klin. Wochenschr.), Pharm. Central., 1892, 697.

——— *Preparations of.*—Pharm. Post., 1892, 1359; Pharm. Centralh., 1893, 52.

Amido-Eugenol Acetate (patented).—A fine powder prepared by the action of a solution of ammonia in alcohol upon eugenol-aceto-ethylic ether. A local anæsthetic.

α-Amidonaphthol—β-Disulphuric Acid.—Pharm. Post, 1893, 209.

Analgen.—Since the introduction of this compound (Proc., 1892, 1045) it has been found that the presence of the benzoyl radical in place of the acetyl radical was more desirable. The name analgene is henceforth only applied to the ortho-ethoxy-ana-monobenzoylamido-chinoline, $C_9H_5NOC_2H_5$-$NHCOC_6H_5$; it is recommended as an antineuralgic, in doses from 0.5–2 grams.—Pharm. Centralh., 1892, 698.

Analgen.—(1 : 4 ethoxyacetamidoquinoline). G. N. Vis describes its preparation and the platinochloride.—Abstract, Jour. Chem. Soc., 1892, 1105.

Analgen—Therapeutics of.—W. Knust.—Berlin: G. Schade. (Pamph.)

Benz-Analgen.—P. Krulle.—Berlin: G. Schade. (Pamph.)

Analgesics.—G. C. L. Vintras.—Med. Press and Circ., Lond., 1893, 197.

Antihydropin is a crystalline body whose chemical nature has not as yet been investigated, but is thought to be the active principle of Blatta orientalis, or the common cockroach. This new agent has been used chiefly as a diuretic in dropsical affections. The daily dose of antihydropin is given as 10 to 30 grains (0.60 to 1.30 gram).—Dr. Cerna in "Notes on the Newer Remedies."—From Amer. Therap.

Antikol.—A new proprietary antipyretic mixture, consisting of 50 per cent. acetanilid, 25 per cent. salicylic acid, and 7.5 per cent. tartaric acid. The proprietors charge from 5 to 6 times the price of the separate ingredients.—Squibb's Ephem., Feb., 1893. (See also Pharm. Rund., 1892, 186.)

Antinonnin is the name given to a paste containing fifty per cent. orthodinitrocresol-potassium; to prevent the paste from drying out, a small quantity of soap is added, as the absolutely dry salt is an explosive compound. Proposed first as a means of protecting trees from the ravages of insects, it has since been found to be a poison for all forms of lower animal life; in quantities of less than one milligram the pure chemical is a sure destroyer of mice, while two centigrams will suffice for rats, in consequence of which phosphorus pastes are to be superseded. As a preservative of wood favorable experiments are reported. It is generally used in aqueous

solution 2 : 500, in which strength it can be advantageously used in the treatment of itch ; for the development of poisonous symptoms very much stronger solutions must be used (1 : 30 applied with a brush produced poisoning of a horse). An objectionable property of the remedy is the intense yellow color which is in some cases removed with difficulty.—Südd. Apoth. Ztg., 1892, 233 and 241 ; Am. Jour. Pharm., 1892, 521.

Antinonnin, See München. Allg. Zeit., 1892, No. 98 ; Abstract, Pharm. Record, 1893, 124 ; Pharm. Post, 1893, 248.

Asbolin.—Béhal and Desvignes show that this is a complex mixture. They point out that it is curious to note that asbolin should contain in the free state the two phenols, which as methyl ethers constitute the chief part of creosote.—Jour. de Pharm. et de Chim., 26, 181. See also Pharm. Zeit., 1892, 764.

Antipyrin—An Alcohol of.—Knorr and Taufkirsch.—Ber. d. Chem. Ges., 25, 768 ; Phar. Centralh., 1892, 439.

Bromopyrin (mono-brom-antipyrin, $C_{11}H_{11}BrN_2O$) crystallizes from hot water in white, velvety needles ; from hot alcohol as shining white needles. It is almost insoluble in cold, and difficultly soluble in hot, water ; easily soluble in alcohol, chloroform, or ether. Its melting point is 114° C. (say 237° F.). Of the therapeutic action of this new antipyrin derivative, nothing definite is as yet known.—Merck's Bull., March, 1893.

A chlorine derivative of antipyrine, to be used therapeutically, according to a patent application, is made by acting upon antipyrine with hydrochloric acid and bleaching powder. It has the formula $C_{11}H_{12}H_2O_3Cl_2$, is insoluble in water, dilute acid, ether, chloroform and ligroin, but soluble in hot alcohol and glacial acetic acid ; in alkalies it is soluble with decomposition ; heated to 228° C. it melts, charring and giving off hydrochloric acid vapors. By heating in a current of chlorine, or passing chlorine through the acetic acid solution and heating with hydrochloric acid or alcohol to 150° C., it is converted into dichlor-methyl-phenyl-pyrazolon, which then can be easily reduced to methyl-phenyl-pyrazolon.—Apoth. Ztg., 1892, 532 ; Am. Jour. Pharm., 1892, 611.

Nitro-antipyrine has been prepared by E. Jandier (Compt. rend., cxiv, 303) by dissolving antipyrine in 10 parts of concentrated sulphuric acid, adding drop by drop ¾ part of nitric acid, spec. grav. 1.35, and pouring the mixture into cold water ; the precipitate, crystallized from boiling acetic acid, forms straw-yellow colored needles, which melt at 260° C., and are slightly soluble in alcohol, but insoluble in cold water.—Am. Jour. Pharm., 1892, 366.

Test for Antipyrin.—A. C. Stark, in New Eng. Drug. ; Meyer Bros. Drug., 1893, 127. Place in a test-tube a few grains of potassium nitrate, add a little water, and then excess of strong sulphuric acid, and fill the tube up with the suspected liquid. A green coloration is immediately produced

if antipyrin be present. This test is delicate and reliable, and has the advantage of being specifically characteristic of antipyrin.

Substances Incompatible with Antipyrine.—The following:

1. Concentrated solutions of carbolic acid.
2. Tannin, and preparations containing tannin.
3. Tincture of iodine.
4. The chlorides of mercury.

The following substances, when triturated with dry antipyrine, decompose it:

1. Calomel, which forms a toxic compound with antipyrine.
2. Beta-naphthol.
3. Chloral hydrate, which forms an oleaginous liquid with it.
4. Sodii bicarbonas, which when brought in contact with it sets free an odor of acetic ether.
5. Salicylate of sodium, which also forms an oleaginous compound with it.
6. The salts of quinine and caffeine, which have their solubility increased by antipyrine.—Meyer Bros. Drug., 1893, 99.

Antipyretics—The Newer.—According to the Pharm. Zeit.; Chem. and Drug., September, 1892, a large number of antipyretics introduced during the last two or three years are simply more or less disguised forms of antifebrin. Thus "*antikamnia*" contains from 70 to 85 per cent. of antifebrin, with 15 to 20 per cent of bicarbonate of soda, and traces of tartaric acid and caffeine; "*antinervin*" is composed of antifebrin, 50 per cent., salicylic acid, 25 per cent., bromide of ammonium, 25 per cent.; "*exodyne*," of antifebrin, 90 per cent., bicarbonate of soda, 5 per cent., salicylate of soda, 5 per cent.; "*phenolid*," of antifebrin, 50 per cent., bicarbonate of soda, 50 per cent.; and "*antikol*," of antifebrin, 75 per cent., bicarbonate of soda, 17½ per cent., tartaric acid, 7½ per cent.

——— *Dangers of.*—Moritz Cohn, of Hamburg (Therap. Monatsh., II.), reports a case of poisoning by the administration of a single dose of 0.5 gram of antipyrin. Some people exhibit a peculiar idiosyncrasy toward antipyrin, hence care is required in its administration.—Pharm. Zeit., xxxvii., 790.

——— Its use is said to cause blackening of the teeth in some individuals, especially when the enamel is imperfect. The discoloration may be removed with dilute hydrochloric acid.—West. Drug., 1892, 300.

Antisepsin.—Another preparation, introduced some time ago as a definite chemical compound called iodo-boro-thymolate of zinc, or antisepsin, is said by Squibb to be simply a mixture of zinc sulphate, 85 parts, boric acid, 10 parts, zinc iodide, 2½ parts, thymol, 2½ parts.—Ephem., 1893, Feb. (See also Pharm. Post, 1893, 106.)

Antispasmin.—A preparation consisting of one molecule of narceine sodium combined with three molecules of sodium salicylate. Merck

describes it as a whitish, slightly hygroscopic powder, readily soluble in water. It absorbs carbonic acid from the air with partial separation of narceine. Dose, from $\frac{1}{10}$ to 1½ grain.—Phar. Jour. Trans., 1893, 606; from Merck's Bericht, 1892, 40.

——— M. Petit in Rép. de Pharm., 1893, 129.

——— E. Merck.—Pharm. Centralh., 1893, 173.

Àntithermin (phenylhydrazin lævulinic acid).—Merck's Ber., Jan., 1893. Colorless crystals, insoluble in cold water, soluble in ether and hot alcohol. The alcoholic solution (0.5 : 10.0) may be diluted with water without causing precipitation. Melting point, 108° C. Doses of 0.5 Gm. lower the temperature slightly. Doses of 1 gr. have caused a lowering in temperature of 2° C. in four hours. It should be administered cautiously to weak individuals, as unpleasant after-effects are apt to follow.

Aristol.—M. Séguier, in the course of an essay on the clinical uses of aristol, gives the following formulas for exhibiting this medicament: *Collodion:* Aristol, 1 Gm.; flexible collodion, 9 Gm. *Ointment:* Aristol, 10 Gm.; olive oil, 20 Gm.; lanolin, 70 Gm. *Crayons:* Aristol, 0.10 to 0.50 Gm.; cacao butter, 5 Gm.—Jour. de Pharm. et de Chim., 1892, 456.

Arasa.—Pharm. Zeitschr. f. Russ., 1891, 822; Notes on New Rem., 1892. The bark of the root of Arasa from Brazil and Uraguay is said to be an excellent remedy in metrorrhagia.

Asaprol or *Calcium β-naphtol sulphonate*, according to Stackler (Compt. rend., cxiv, 1027), may be readily obtained by operating with pure β-naphtol, free from the α modification. It is freely soluble in water and alcohol, has a neutral reaction, is not irritating, is but slightly poisonous, and is excreted through the urine. It acts as an antipyretic in various diseases, and when used in comparatively large proportion prevents the development of the bacteria of cholera, typhoid and anthrax.—Amer. Jour. Pharm., 1892, 517.

——— Merck's Ber., Jan., 1893. A white powder soluble in water (1 : 1.5) and in alcohol (1 : 3). Possesses antithermic, antirheumatic and analgesic properties, and may be used to advantage in influenza, acute articular rheumatism, asthma, etc. 4 Gm. of asaprol produce the same effect as 6–8 grams sodium salicylate in the treatment of rheumatism.

——— A. Bompard, in Thesis, Fac. de Med. de Paris, 1892; Amer. Jour. Med. Soc., 1893, 86. See also Pharm. Post, 1892, 884.

Benzanilid (phenyl-benzamid).—An antipyretic closely allied chemically and therapeutically to acetanilid. It is produced by boiling together equivalent quantities of benzoic acid and aniline, and occurs as a white crystalline, odorless powder, with a slightly caustic taste and is practically insoluble in water. It is given to children in initial doses of 100 to 600 milligrams (1½ to 9 grains).—Squibb's Ephem., Feb., 1893.

Benzol (Benzene).—Useful in the treatment of pertussis and influenza and destroying Pediculi capitis or pubis. In the latter a single application alone is sufficient; fire must be avoided.—(Ibid.)

Benzonaphtol (β-naphtol benzoate) occurs in small, dull white, odorless and tasteless crystals, practically insoluble in water at ordinary temperatures.

——— is preferred by M. Huchard, for intestinal antisepsis, to salol or betol, because by its use the often dangerous effects of salicylic acid are avoided; furthermore, it has the advantage of being insoluble and scarcely toxic. The author usually prescribes the following in doses of six to eight cachets per day: benzonaphtol, 20 Gm., and pulverized charcoal, 5 Gm., for 30 cachets.—Rép de Pharm., Feb., 1893, 86; Am. Jour. Pharm., 1893, 229.

——— is regarded by Dr. Gilbert (La Tribune Méd.) as a valuable intestinal antiseptic which is not altered in the stomach, but is decomposed in the intestines into benzoic acid and naphtol.—Ibid., 1892, 517.

——— *in Gastro-Enteritis of Infants.*—Brück (Sem. Méd., December, 1892,) gives the daily dose of benzo-naphtol for infants as follows: Up to the sixth month, 20 to 50 centigrams; from the seventh to the twelfth month, 60 to 80 centigrams; from one to three years, 1 gram; from four to seven years, 1.5 grams; from eight to fourteen years, 2 grams. The daily dose must be divided into five portions.—Am. Therap., 1893, 314.

Benzosol (benzoylguaiacol) has recently been claimed a successful remedy for diabetes; to ascertain the decrease of the sugar in the urine the polariscope was used. The urine of a person undergoing the benzosol treatment was found to be lævogyre, and accordingly was pronounced free from sugar, but by the use of Fehling's solution and phenylhydrazine the urine was found to contain about 1 per cent. of sugar. Experiments made by administering benzosol to non-diabetic persons proved that this remedy caused lævogyre rotation of the urine, hence the indications of the polariscope are to be supplemented by other tests for sugar in urine.—Dr. A. Jolles, Pharm. Post, 1893, 101 and 114; Am. Jour. Pharm, 1893, 225. (See also Squibb's Ephem., Feb., 1893.)

Bismuth and Phenol—A new class of Intestinal Antiseptics.—They are insoluble, tasteless, odorless and neutral. Of particular importance are the following: Phenol-bismuth, kresol-bismuth, resorcin-bismuth, β-naphtol-bismuth, tribromphenol-bismuth.—Pharm. Post, 1892, 1289.

Betanaphtol-Bismuth.—A brown, odorless and neutral powder, insoluble in water and given in doses of 1–2 Gm. pro die.—Ibid., 1893.

Tribromphenol-Bismuth.—A yellow, neutral, insoluble powder; tasteless, odorless and almost non-poisonous, containing 50 per cent. tribromphenol and 49.5 per cent. bismuth oxide. The dose for an adult is 5–7 Gm. In single dose 0.5 Gm.—Pharm. Post, 1893, 221.

Benzoparacresol, analogous to *benzonaphtol-benzosol*, is prepared, according to M. Petit, by treating paracresol with sodium benzoate in the presence of oxychloride of phosphorus; it crystallizes from hot alcohol in beautiful crystals, having a slight ethereal odor, and a fusing point of 70–71° C.; insoluble in water, but very soluble in ether and chloroform.—Jour. Pharm. Chim., 1893, 294.

Boro Borax is formed by mixing equal parts of borax and boric acid in boiling water. When the water cools, the greater part of the substance crystallizes out. Its antiseptic and therapeutic properties resemble those of boric acid, but it has a neutral reaction and is much more soluble. At ordinary temperature 16 parts of boro-borax dissolve in 100 of water; at 100° F. 30 parts dissolve in 100 of water; while boiling water dissolves 70 per cent.—Med. Record; Pharm. Record, 1892, 485.

Boro-Glycerin-Lanolin.—A mixture of boric acid, lanolin, and glycerin, used for oiling catheters, etc.—Therap. Monatsh., 1892, 564; Pharm. Centralh., 1892, 631.

Bromamide occurs in silky, colorless crystals, insoluble in water, slightly soluble in alcohol, soluble in ether, chloroform, and ethereal and fixed oils. Good results have been obtained in its use as an analgesic in neuralgia and menstrual colic.—Nat. Drug., 1892, 24.

Bromoform.—The liquid must be clear and colorless, with an agreeable odor and sweet taste. If otherwise it denotes decomposition. Glycerin, as recommended by P. W. Bedford, is the best solvent.—Squibb's Ephem., Feb., 1893. (See also Pharm. Post, 1893, 71.)

Butylhypnal or Chloral Antipyrine.—Bernin has combined butylchloral with antipyrine, which results in a compound analogous to hypnal or chloral antipyrine, and proposes the name butylhypnal. It forms light colorless crystals, having the odor of butylchloral, and a bitter taste, is fusible at 70° C., slightly soluble in water, and very soluble in alcohol, ether, benzin, and chloroform. The solution is colored red by ferric chloride, and yields an abundant crystalline precipitate on the addition of picric acid. It is decomposed by alkalies, and reduces potassium permanganate.—Union Pharm., Oct., 1892; Am. Jour. Pharm., 1893, 74.

Caffeine-Iodol.—If caffeine and iodol, in molecular proportion, be mixed in alcohol solution, a crystalline addition product separates. The product is of a light gray color, odorless, tasteless, and insoluble, or nearly so, in most solvents; it contains 74.6 per cent. iodol, and 25.4 per cent. caffeine. As iodol, by prolonged keeping, liberates iodine, and thus has injurious effect, the above permanent compound is considered worthy of trial.—E. Konteschweller, Pharm. Centralh., 1893, 95.

Calcium Chloride added to a fibrin-ferment solution forms a combination which is suggested as a new styptic.—A. E. Wright, Brit. Med. Jour., 1891, 1306; Squibb's Ephem., Feb., 1893.

Camphopyrazolon.—A new patented preparation, made by the action of ethyl camphocarbonate and phenylhydrazin. It melts at 132–133° C.; with difficulty soluble in hot water, more soluble upon the addition of hydrochloric acid, slightly soluble in hot alcohol, insoluble in ether, and is medicinally analogous to methylphenylpyrazolon.—Chem. Zeit., 1892, 1957.

Cardine—The Extract of the Heart.—Its preparation and physiological and therapeutical effects.—W. A. Hammond, N. Y. Med. Jour., 1893, 429.

Chloralimide—Solubility of.—G. Lunan finds that one part is soluble, at 60° F., in 20.5 parts of water.

——— *Physiological Effects of.*—Piccinimo in Annal. di Neurolog.; Notes on New Rem., 1893, 10.

Chloralose.—This name is proposed by Hanriot and Richet for a body which they obtained from the combination of chloral and glucose, and with which they obtained excellent results as a hypnotic. They are of the opinion that M. Hefter, who had previously mentioned this substance, but who considered it very toxic, did not obtain it in a state of sufficient purity. For its preparation equal quantities of anhydrous chloral and dry glucose are mixed and heated to 100° C. for one hour. Upon cooling, the thick mass is treated with a little water and then with boiling ether. By removing the ether-soluble portions, adding water and distilling five or six times with water, until all the chloral has been driven off, a residue is obtained, which by successive crystallizations is separated into two bodies; the first of these, slightly soluble in cold water, but soluble in hot water and alcohol, is chloralose; and for the second, difficultly soluble even in hot water, which is probably the cause of its inactivity, the name parachloralose has been proposed.—Nouveaux Remèdes, 1893, 29; Am. Jour. Pharm., 1893, 129. (See also Compt. rend., cxvi., 63.)

Chloraloximes.—A new series of compounds, said to possess strong physiological properties, has been recently prepared. The chloraloximes obtained are chloralacetoxime (melting point, 72° C.); chloralcamphoroxime (melting point, 98° C.); chloralnitroso-β-naphtol (melting point, 100° C.); chloral-acetaldoxime (melting point, 74° C.); chloral-benzaldoxime (melting point, 62° C.). The compounds are easily soluble in alcohol and ether, and are readily recrystallized from petroleum ether. Water dissolves them with difficulty, and when applied hot is apt to cause decomposition and the reformation of chloralhydrate. Probably the physiological action of these chloraloximes is due to their splitting up in the system into chloralhydrate and their respective oximes.—Chem. Ztg., 1892, 348; Pharm. Post, 1892, 1248.

Coryl is a new anæsthetic of considerable value in dentistry and minor surgery. It is a mixture of methyl chloride and ethyl chloride. Though it does not produce as great a cold as methyl chloride, it has the advantage of being still liquid at 0° C., while the latter boils at —27° C.—Jour. de Pharm. d'Anvers, 1893, 16; Am. Jour. Pharm., 1893, 129.

Cresalols or Cresol Salicylates.—R. Neisse. Corresponding to the three isomeric cresols there are three cresalols differing in the relative positions of the methyl and hydroxyl groups in the benzene nucleus. All three are white crystalline bodies, with slight salol odor, the meta-cresalol being best adapted for a dusting powder. Ortho-cresalol produces a slight burning sensation on the tongue and in the throat; both the others are completely free from irritating properties, and all three are practically insoluble in water. Neisse finds that as substitutes for sodium salicylate in rheumarthritis and pleuritis exudativa, ortho- and para-cresalol are equal to salol. They are also suitable as antiseptics of the intestinal and urinary tracts. The administration is best effected without adjuncts, in doses of 15 grains, or, if strong antiseptic action is required, 30 grains may be given, 90 to 120 grains *pro die* being easily borne. By-effects were never of a serious nature, and not more pronounced than with salol.—Pharm. Post, 1892, 1216.

Creasotal.—J. Brissonet prepares this by combining carbonic acid with beech-wood creosote. It is a viscous liquid without odor when pure, and has a slight flavor of creosote; insoluble in water, glycerin, and dilute alcohol, but soluble in all proportions in strong alcohol, ether, chloroform, and benzine. Its specific gravity is 1.165. One hundred parts of it correspond to ninety of creosote, but, in daily doses of ten to twenty Gm., it does not disturb the digestive functions. In the intestines it splits up into creosote and carbonic acid, and its use is indicated in tuberculosis, etc., as a substitute for creosote.—Phar. Jour. Trans., 1893, 686; Rép. de Pharm, 1893, 49.

Creosote Carbonicum, a clear viscous liquid of a light brown color, insoluble in water, miscible with ether and alcohol, and soluble in fatty oils. It is odorless, and does not possess the burning taste of creosote, it being scarcely bitter. It is used in lung tuberculosis in doses of 5 grains or more. —Merck's Ber., 1893.

Cresol Preparations of Commerce.—Preparation and properties of sapocarbol, Little's solution, Jeye's disinfectant, Pearson's creolin, Artman's creolin, Brockman's creolin, lysol, solveol, and solutol.—Pharm. Centralh., 1892, 301; Pharm. Rund., 1892, 169.

Cresol Saponate, a mixture of soft soap and carbolic acid.—Centralb. f. Gynecol.; Am. Drug. and Pharm. Record, 1893, 327.

Dermatol.—In purulent otorrhœa.—Nouv. Rem., 1892, 408.

——— References: Squibb's Ephem, Feb. 1893; Pharm. Post, 1892, 856.

Diaptherin.—See Oxychinaseptol.

Digitalinum Verum.—Franz Pfaff has administered this substance prepared from Digitalis purpurea and has not as yet observed any cumulative action. The daily dose is from ⅛ to ¾ of a grain, administered subcu-

taneously in diluted alcohol, to which cocaine is added.—Corres. f. Schweizer Aertze, 1892, 696; Am. Jour. Med. Sci., 1893, 185.

Dithion (*Sodium Dithiosalicylicum*).—L. Hoffman. It is an energetic antiseptic in wounds in the form of a solution, powder or ointment.—Zeits. Oest. Apoth. Ver., 1893, 333.

Diuretin.—Attention is called to the great discrepancy in price between the article when bought under its short name, diuretin, or under its chemical title, sodio-theobromine-salicylate—the latter, when you insist on having it, costing less than half the former.—Squibb's Ephem., Feb., 1893.

Dulcin.—See *Sucrol* also.

Dulcin is a product which, because of its intense sweetness and its non-poisonous character, seems destined to become a serious competitor of saccharine; it was prepared first in 1883 and its sweetening power then recognized, but the cost of manufacture was too great. Patents have now been applied for its preparation from *p*-phenetidine by the action of ammonia and carbon oxychloride. The chemical name of the compound is *p*-phenetol-carbamide and its formula $C_6H_4(OC_2H_5)NHCONH_2$.—Apotheker Ztg., 1892, 550; Am. Jour. Pharm., 1892, 611. See also Pharm. Post, 1892, 1172; 1893, 106, 233, 269; Pharm. Jour. Trans., 1893, 888.

Epidermin.—Under this name a surgical dressing which, by evaporation, leaves an elastic film, is introduced; a similar preparation is made by melting 15 parts white wax and triturating in a warm iron mortar with 15 parts powdered acacia until a uniform mass results; to this is then added a boiling mixture of 15 parts each distilled water and glycerin and the mixture stirred until cold. Any medicinal agent to be incorporated with epidermin should be rubbed up with glycerin.—Zeitschr. Oest. Apoth. Ver., 1892, 271; Am. Jour. Pharm., 1892, 368.

Ethyl Chloride as a Local Anaesthetic.—Ehrmann in Deutsch. Med. Zeit., 1892, 747; Pharm. Centralh., 1892, 509.

Exalgine.—J. Gordon prescribes this remedy in 4 grain doses with Tr. Cardamomi Comp. and Syr. Aurantii, repeated every 4 hours.—Lancet, 1892, 1173. (See also Squibb's Ephem., Feb., 1893.)

——— *Contribution to Pharmacology; an Experimental Examination of Exalgin.*—A. P. Morozoff.—Pskov. 97 p. (Pamph.)

Exalgin and Salicylic Acid, Reaction between.—On triturating these twocompounds in a mortar, De Parel, of Dieppe, observed (Rep. de Pharm., July, 1892) that the mixture formed a soft paste which soon became liquid. These two chemicals should, for the reason stated, not be prescribed together in a solid form; but on replacing the salicylic acid by sodium salicylate, the difficulty is obviated.

Exodyne.—Goldman found it to contain: Acetanilid, 90 per cent.; sodium bicarbonate, 5 per cent., and sodium salicylate, 5 per cent. It is an antipyretic in 10-grain doses.—Squibb's Ephem., Feb., 1893.

Eugenol-Acetamide.—A new anæsthetic, similar to cocaine, has been found in eugenol-acetamide. By successive reactions eugenol is changed into eugenol-sodium, eugenol-acetic acid, ethyl eugenol-acetate and eugenol-acetamide. Crystallized from water it forms lustrous scales, from alcohol delicate needles melting at 110° C. Applied in the form of a fine powder, it produces local anæsthesia, without any caustic action; this effect, in conjunction with the strong antiseptic property of eugenol-acetic acid, makes it a desirable compound in the treatment of wounds. Patents for its preparation had been applied for by the Farbwerken.—Pharm. Centralh., 1892, 441.

Euphorin (Phenyl-urethane).—H. Köster. It is used as an antipyretic and antiseptic, but more especially for rheumatism and neuralgia, in 8 grain doses, three times daily, in the form of a powder. — Therap. Monatsh., 1892, 397; Am. Jour. Med. Sci., 1893, 84.

——— Summary of C. Curtis' clinical experiments and bacteriological researches.—Squibb's Ephem., Feb., 1893.

——— Dr. Eichoff is inclined to abandon its subcutaneous use in syphilitic ailments, since the benefit it causes is only temporary, but as an external application in syphilitic soft ulcers, he finds it of very great advantage. He says also that it is of use in gonorrhœa of women with ulcerations in the vagina and on the cervix uteri. He looks upon europhen, then, as a substitute for iodoform, over which it has the advantage of causing no injurious effects after absorption, and having no unpleasant smell. —Therap. Monat., Jan. 1893; Med. Chron., 1893, 331.

Formanilide, $C_6H_5NH\ CHO$, at a recent meeting of the Royal Medical Society in Budapest, was praised by six physicians as an analgetic, anæsthetic, antipyretic, antineuralgic and as a hæmostatic, combining therefore the properties of acetanilide, antipyrine and cocaine; the anæsthetic action of a 20 per cent. solution lasted 1–1½ hours, but was inferior to that obtained with cocaine, which, however, only lasted twenty minutes. Formanilide crystallizes in long, four-sided, flattened prisms, melting at 46° C., soluble in water and especially in alcohol.—(Wiener Med. Presse), Pharm. Ztg., 1893, 160; Am. Jour. Pharm., 1893, 286.

Formalin is a 40 per cent. aqueous solution of formaldehyde; it is a disinfectant, can be used either in solution as a spray or as a vapor, and resembles mercuric chloride in being a destroyer of bacteria, and differs from it in being non-poisonous. For the permanent sterilization of bandages, *formalith* is recommended; this is a cartridge made of infusorial earth, which has the power of absorbing an equal weight of formalin; it is claimed that by placing formalith in bottles or boxes containing the bandaging material, this is perfectly and permanently sterilized. An interesting property of formalin is worthy of note. If placed upon animal skin it changes the latter into leather, making it non-porous and hard.—J. Stahl, Pharm. Ztg., 1893, 173; Ibid.

Gallanol.—Blanc describes this as a white crystalline compound, having a slightly bitter taste, and melting at 205° C. without decomposition. It is obtained by heating tannin with aniline and treating the product with water acidified with hydrochloric acid, after which it forms crystals which can be purified by repeated crystallization from aqueous alcohol. The compound is only slightly soluble in cold water, very soluble in boiling water and in alcohol, soluble also in ether, but insoluble in benzin and chloroform. Alkalies dissolve it without sensible decomposition, but cause a brown coloration. In doses of two grams, gallanol has no ill effect upon man, but it is chiefly indicated for external application. It causes no irritating effect upon the skin, to which it may be applied in the form of powder; has also been used with advantage in cases of psoriasis and eczema in the form of a pomade with soft paraffin basis, containing one-twentieth, one-tenth, or even one-fourth of the medicament, and is said to be preferable to chrysophanic and pyrogallic acids.—Phar. Jour. Trans., 1893, 888; Rev. de Thérap., 60, 214.

Gallacetophenon (Tri-oxy-aceto-phenone), a recent and promising substitute for pyrogallic acid in most skin affections, principally in psoriasis.—Squibb's Ephem., Feb., 1893.

Guaiacol Carbonate—Antiseptic Properties of.—The employment of guaiacol as a pulmonary antiseptic is prevented by its caustic and irritant properties, and the remedy can only be prescribed in small doses. This is not the case with the guaiacol carbonate, which is a well-defined, odorless, tasteless salt, insoluble in water, and has no irritant action on the mucous membranes. It is not toxic, and acts as an antiseptic in phthisis; it is found in the urine a half hour after its ingestion.—J. Brissonnet, in Rép. de Pharm., Oct., 1892.

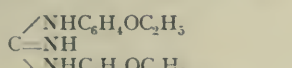
Guaiacol Carbonate and Creosote Carbonate in the Treatment of Pulmonary Phthisis.—The excellent results obtained with guaiacol and creosote constitute these remedies true specifics for phthisis. But as it is necessary to resort to subcutaneous or rectal administration, in order to apply the necessary doses, M. Chaumier (Bull. gén. de Thérap., Dec., 1892, p. 519,) recommends the use of the respective carbonates. He says he has administered 6 Gm. a day of the guaiacol salt, while of the carbonate of creosote he has given as much as 5 Gm. per day. The author prefers the carbonate of creosote to that of guaiacol, although the latter is a solid and more easily administered, because the creosote salt contains not only the carbonate of guaiacol, but also the carbonates of the other bodies present in the creosote.—Am. Jour. Pharm., 1893, 73.

Synthetic Guaiacol is prepared by Behal and Choay by dissolving 58 Gm. of sodium in 600 Gm. methyl alcohol, and adding 270 Gm. of pyrocatechin, also previously dissolved in methyl alcohol. The mixture is heated to 120–130° C. with an excess of methyl iodide; allowed to cool

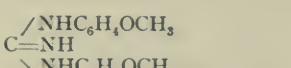
and the alcohol recovered by distillation. The residue treated with sodium oxide and agitated the sodic solution with ether to remove a small quantity of veratrol present. The guaiacol is liberated by means of hydrochloric acid, and then distilled. If the portion passing over at 205° to 207° C is cooled by means of methyl chloride, the product obtained in crystals consists of pure guaiacol. It is a white, well-crystallized solid, fusible at 28.5° and boiling at 205° C.—Rép. de Pharm., March, 1893, 101; Am. Jour. Pharm., 1893, 228.

Creosote and Guaiacol.—W. Brandes calls attention to the fact that these articles are now met with in commerce, presenting characters which show that they contain considerable amounts of empyreumatic oils from the distillation of wood, varying from 19 to 31 per cent.—Phar. Jour. Trans., 1892, 342.

Aromatic Guanidines.—Two of them, termed diparaphenetolguanidine and diparanisolguanidine, have the formulas:



Diparaphenetolguanidine.



Diparanisolguanidine.

The former crystallizes in lustrous, colorless needles, melting at 122.5° C., the latter in delicate prismatic needles, melting at 153.5° C. The bodies are difficultly soluble in water, but possess a well-marked bitter taste. The free bases are readily taken up by alcohol.—Notes on New Rem., 1893, 150. (See also Pharm. Post, 1893, 172.)

Haemogallol (patented), a brownish-red powder given in doses from 100 to 500 milligrams (1½ to 7½ grains) shortly before each meal, in any convenient vehicle which will not retard its rapid absorption, or also in capsules.—Squibb's Ephem., Feb., 1893.

Haemol is a closely allied preparation to haemogallol (see above), and is obtained by the same process, except that the reducing agent used in the case of haemol is zinc—presented in the form of a fine dust, and shaken up in the presence of water. The dose and mode of administration are the same as for haemogallol.—(Ibid.)

Hydrargyrum Tribromphenolo-aceticum is a yellow crystalline powder, sp. gr., 1.59, containing 29.31 per cent. mercury. It is used in the form of an injection according to the following formula: Hydrargyri tribromphenolo-acet., 6.5; paraffin liq., 18.0 (0.5 C.c.=0.039 Gm. metal).—Merck's Ber., Jan., 1893.

Hypnal.—(Mono-chloral-antipyrine.) Most of the preparations now in the market under the name of hypnal differ considerably, both chemically and in their physiological action. The hypnal of trade is almost insoluble in boiling water, and shows no antipyrine reaction. On the other hand, active hypnal, or, as termed by Filehne, "per-hypnal" (hypnal-Höchst),

dissolves very readily in hot water, and gives the characteristic tests for antipyrine. Moreover, it is physiologically very effective, and merits the name of hypnal. The hypnotic action of this substance does not depend solely on the amount of chloral contained in it (45 per cent., to 55 per cent antipyrine), the active dose of hypnal being not really larger than that of chloral. Further, an equivalent dose of chloral produces much more prostration. This substance is easily soluble in the proportion of one in ten of water, has so little taste that it scarcely requires a flavoring medium for its administration, and may be given in a dose ranging from 15 to 30 grains.—Berlin klin. Wochenschr., 1893, No. 5 ; Ann. Therap., 1893, 316.

New Hypnotics.—A compilation of brief definitions is to be found in Notes on New Pharm. Prod., Feb., 1893 (repub. in Notes on New Rem., 1893, 160,) and brings together in terse comparison the following remedies of the hypnotic class: Amylene hydrate, bromal hydrate, chloralamide, chloral-ammonium, chloralimide, croton-chloral, hypnal, hypnone, metaldehyde, methylal, rubidium, ammonium bromide, somnal, sulphaldehyde, sulphonal, thymacetin, trional, uralium or ural, urethane.

Ichthyol and its Use in Dermatology.—E. Schwimmer.—Pharm. Post, 1892, 1344.

Iodeugenol is a light yellow or colorless derivative of eugenol, insoluble in water, odorless, melting at 150°.—Pharm. Post, 1893, 209.

Iodum Tribromatum is a dark brown liquid of a penetrating and unpleasant odor. It is used in angina diphtheritica in the form of a spray and gargle.—Merck's Ber., Jan., 1893.

Iodol-Caffeine.—E. Konteschweller states that when alcoholic solutions of iodol and caffeine in molecular proportions act upon each other, a crystalline compound, sparingly soluble in alcohol, is obtained, which has the composition represented by the formula $C_8H_{10}N_4O_2C_4I_4NH$. The compound is a greyish crystalline powder, without taste or smell, insoluble or very sparingly soluble in most solvents. It contains 74.6 per cent. iodol and 25.4 per cent. caffeine. On account of the much greater stability of this body as compared with iodol, which eliminates iodine when kept, it is suggested that the caffeine compound may be worth a trial for medicinal purposes, and that it may serve to obviate the disagreeable effects sometimes produced by iodol.—Phar. Jour. Trans., 1893, 805 ; from Pharm. Centralh., xxxiv, 95 (also Pharm. Zeit., 1893, 110).

Iodophenin.—When a solution of phenacetin in water, alcohol, or glacial acetic acid is mixed with a solution of iodine in potassium iodide or other suitable solvent, and a mineral acid added to the mixture, a chocolate-colored crystalline powder is precipitated, having the composition $C_{20}H_{25}N_2O_4I_3$. The product appears to contain 2 molecules of phenacetin to 3 atoms of iodine. It is almost insoluble in water, readily soluble in

alcohol and in glacial acetic acid, and melts at 130° C. with decomposition. The solution decomposes on boiling with evolution of iodine. Recrystallized from glacial acetic acid, large oblong crystals are obtained having a greenish-red luster. The name iodophenin is proposed for the new compound, which, owing to the ease with which it gives off iodine, is applicable for therapeutic purposes.—Jour. Soc. Chem. Ind., 1893.

Iodo-Pheno-Chloral is the name applied to a mixture of equal parts of tincture of iodine, carbolic acid, and chloral hydrate, which is recommended by C. Cutler (Journ. Cutan. and Gen.-Urinary Dis.) in skin affections, especially those of a parasitic origin.—Pharm. Zeit., 1892, 200.

Iodozonic Acid.—M. Robin. Obtained in the form of white crystals by treating iodozone with sodium chloride. It differs from iodic acid in being insoluble in water, alcohol, and ether. By making a mixture of iodozone with ozonized ether and sea-salt we obtain a liquid which, atomized in a bed room, will absolutely reproduce "an artificial marine atmosphere." It is hinted that this article is soon to be exploited under the attractive head-line of "The Sea Brought to the Bedside."—Bull. Pharm., 1892, 521.

Iodozone is the name given by Robin to a solution of iodine in ozone. The solution appears to be a complete one, as no free iodine can be detected. The beneficial expectations were first suggested by the well known value of pure sea air—containing traces of iodine (!). It is recommended to be used as a spray in pulmonary tuberculosis and on open wounds.—Pharm. Centralh., 1892, 468. (Also L'Union Pharm., 1892, No. 7.)

Kresin.—A name given to a solution of cresol in a solution of sodium cresoxyl acetate, it containing 25 per cent. cresols; the solution is miscible with water and alcohol in all proportions; it is less poisonous than phenol, and is said to have four times its antiseptic value, and as a disinfectant to be especially valuable. In one-half to one per cent. aqueous solutions it is deemed of value in the treatment of wounds.—Pharm. Central., 1892, 698; Am. Jour. Pharm., 1893, 9.

Lactoserin is a preparation which has resulted from attempts to utilize skimmed milk and whey. The skimmed milk is treated with rennet, and the separated curds pressed out, dried in ovens, and ground. There are several kinds of lactoserin, showing different compositions. This is due to the fact that different proportions of skim-milk and whey are used. J. C. Bell gives the average of several analyses of what is called "double lactoserin:" Water, 3.32; protein matter, 22.56; fat, 1.34; carbohydrates, 66.13; ash, 6.92.—Jour. Soc. Chem. Ind., 1893, 15.

Losophan or *tri-iodo-meta-cresol* is prepared by the action of iodine upon *m*-oxytoluic acid in the presence of the calculated quantity of alkaline hydrate or carbonate; the carboxyl group, present in the acid, suffers oxidation to carbonic oxide, and the new compound, $C_6HI_3CH_3OH$, re-

sults. It appears in the form of white needles, melting at 121.5° C.; it is difficultly soluble in alcohol, but readily soluble in ether, chloroform, benzol, and at a temperature of 60° C., also in fixed oils; dilute sodium hydrate solution dissolves it, but a concentrated solution changes the losophan into a greenish-black, amorphous body. The preparation contains about 80 per cent. iodine, and upon ignition yields copious iodine vapors. Solutions in dilute alcohol (50 per cent.) are subject to decomposition, but a solution in 75 per cent. alcohol remains unchanged for considerable periods. Saalfeld has used a one per cent. alcoholic solution or a 2 to 3 per cent. ointment (containing petrolatum or a mixture of lanolin 80 per cent. and petrolatum 20 per cent. as the base) with success in skin diseases (Herpes tonsurans, Pityriasis versicolor, etc.).—(Therap. Monatsh.) Pharm. Centralhalle, 1892, 613.

Lysol.—The conclusion for the year may be best summed up as done by Cadéac and Guinard, who have made a series of experiments with it:

It is superior as a microbicide to carbolic acid, creolin, cresyl and other analogous coal tar products; it has not, however, any advantages over the antiseptics of established reputation; it is really efficacious only when used in solutions which may be irritating or caustic; although not destined to play a great part in surgery, it may often be useful in the prophylaxis and arrest of epidemics; it is likely to be particularly serviceable in the disinfection of premises, privies, ships and stables; it is readily soluble, reasonably active, and very cheap.—Squibb's Ephem., Feb., 1893.

Lipanin.—Gathered notes on this medicament.—Notes on New Rem., 1893, 151.

Methylene Blue, when taken internally, has the property of imparting a green color to the urine. A French physician proposes to take advantage of this in order to ascertain whether patients take the medicine prescribed for them. About seven grains of the blue may be administered with the medicine without producing any injurious effects.

Methylene iodide—CH_2I_2—is a yellowish fluid, of a specific gravity at 5° C. (41° F.) of 3.342, and boiling with partial decomposition at 180° C. (356° F.)—Merck's Bull.

Methyl-violet in Diphtheria.—The substance of a lengthy article in the *Therap. Monatsh.*, by Jaenicke, regarding his experience with methyl-violet in the treatment of diphtheria may be summed up as follows: The author uses a warm solution of corrosive sublimate, and applies the dye with absorbent cotton upon the diphtheritic membrane, which, with the surrounding membrane, speedily becomes blue. As soon as the color has nearly disappeared, in about two to four or five hours, the application is repeated, and at each repetition the application should be more copious. If the membrane begins to disappear, the intervals between application should be lengthened. The chief value of methyl-violet is in the early stages of the

disease; if the disease is too far advanced, it is powerless. The author recommends methyl-violet because it has a marked antiseptic effect upon Löffler's bacillus, and because it prevents the work of the bacillus, rather than prevents its growth. The solution needs to be applied at intervals, or as soon as the color has left the membrane. Methyl-violet has as yet not been found to be poisonous.—Pharm. Record, Oct., 1892.

Methyl-Violet and Blue.—J. F. Whittaker.—J. Amer. Med. Assoc., 1892, 710.

Para-Methoxyphenyldimethylpyrazolon.—A new patented preparation used as an antipyretic and antineuralgic.—Pharm. Post, 1893, 209.

Mono-chlor-napththalene—Alpha.—$C_{10}H_7Cl$—is a fluid of a specific gravity at 6° C. (42.8° F.) of 1.2028 and boiling at 250° C. (482° F.)—Merck's Bull.

Monochlorphenol is suggested for the treatment of pulmonary tuberculosis. It is prepared by the action of chlorine gas upon phenol at a low temperature. It must be kept in a cool place until ready for use, for theoretically it is to its extreme volatility that it owes its beneficial effects.—Squibb's Ephem., Feb., 1893.

Myrrholin, a patented solution of myrrh made by digesting the gum-resin with castor oil and alcohol, is intended for use as an embalming agent; capsules of the same have been prepared containing 0.2 myrrholin and 0.3 creasote.—Am. Jour. Pharm., 1892, 523; Pharm. Centralh., 1892, 500.

Naphtalene, and α- and β- Naphtol—Detection of.—These three substances give characteristic color reactions if heated for ten minutes with melted chloral hydrate. L. Reuter employs this method in discriminating between them. The color reactions vary, as we use chloral hydrate alone, or, in addition, five drops of hydrochloric acid, or hydrochloric acid with zinc. The reactions are as follows:

	0.1 Gm. naphtalene.	0.1 Gm. α-naphtol.	0.1 Gm. β-naphtol.
With 2.5 Gm. chloral hydrate.	Colorless.	Intense ruby, transparent, non-fluorescent.	Pure blue, transparent, non-fluorescent.
With 2.5 Gm. chloral hydrate + HCl.	Almost colorless, very faint rose.	Intense deep greenish blue, opaque.	Intense yellow, transparent.
With chloral hydrate as before, + zinc.	Violet, then brownish.	Deep violet blue, on adding water violet flocks which dissolve in alcohol with a reddish violet with violet fluorescence.	Deep dark brown; on adding water separation of a smeary substance which dissolves in alcohol with a yellow color, with blue fluorescence.

Drug. Bull, 1892, 272.

β-Naphtol in Medicine.—It is suggested by Carswell that this substance ought to be demanded in scales, as the lowest guarantee of quality. From experiments the formula seems to be $C_{10}H_8O$.—Pharm. Jour. Trans., 1893, 991.

Naphtalin and Naphtol—Recent work upon. (See Squibb's Ephem., Feb., 1893).

β-Naphtol Carbonate is described as consisting of shining crystalline scales, melting at 176° C. It is said to possess the advantage over β-naphtol of being less irritating. Like guaiacol-carbonate, it splits up in the intestine.—Pharm. Centralh., 1893, 115.

Hydronaphtol (so called) and impure Beta-naphtol.—An examination. —With a special report on an analysis of hydro-naphtol by C. P. Beckwith.—D. D. Stewart, Med. News, 1893, 348.

Nuclein, according to Germain Sée, is a substance extracted from the nucleus of the cells of the splenic pulp and more recently from various other cells. In its chemical character it is distinct from the albumins, as it contains phosphoric acid; it is a colorless or yellowish powder, insoluble in water and alcohol, soluble in alkalies. Administered in doses of 2 or 3 Gm. it has no action on man, beyond the one phenomenon that it increases the number of white globules, which are veritable phagocytes, and it is likely to prove of great service in the diagnosis of latent tuberculosis. —Nouv. Rem., May, 1893, 221; Amer. Jour. Pharm., 1893, 341.

Nutrine.—Chemist and Druggist refers to this new food. It seems to be a kind of peptone in cheap form, and six ounces make a day's supply of that (albuminous) kind of food for a strong man. It is a brown powder, having a pleasant flavor of cooked meat. Its strength in albumen is represented as being 87.94, the equivalent of 14.17 nitrogen.

Oleo-Creosote is formed by the action of trichloride of phosphorus upon molecular weights of oleic acid and creosote. It is a yellow liquid of sp. gr., 0.95 at 15°, insoluble in water, slightly so in 90 per cent. alcohol, more so in absolute alcohol, and soluble in all proportions in ether, benzol, CS_2, fatty oils, chloroform and turpentine. It has a creosote taste but does not burn, and is used internally preferably, in emulsion. (Patented.)—Pharm. Post, 1893, 196.

Oleo-Guaiacol is prepared similarly to oleo-creosote.

Oxychinaseptol or *Diaphtherin*, a new antiseptic in which combination is effected between one molecule ortho-phenol sulphonic acid (sulpho-carbolic acid, aseptol) and two molecules of oxychinoline. It is stated to have the formula:

$$OH\,NC_9H_6OH$$
$$C_6H_4SO_2OH\,NC_9H_6OH$$

and forms a yellow powder, easily soluble in water; dilute alkalies and

blood cause a separation of oxychinoline to which is due its antiseptic value. It is used in one per cent. solution; and is admitted to have one disadvantage, namely, causing a dark precipitate (resembling tannate of iron) when brought in contact with iron instruments which are not evenly nickel-plated. Some other metals react in the same way; these colorations are objectionable if any stitching has to be done, since the black spots may not disappear again.—Prof. Emmerich, Pharm. Ztg., 1892, 317; Am. Jour. Pharm., 1892, 374.

——— Recrystallized from water it forms amber-yellow, transparent, hexagonal crystals, which powdered are soluble in at least an equal weight of water; melting point 85° C.; not decomposed until heated to 180–220,° when phenol distils over; between 220° and 250° a mixture of oxychinoline and phenol distils, and between 250–269° C. oxychinoline with traces only of phenol passes over; the aqueous solution with ferric chloride occasions a blue-green color, destroyed by hydrochloric acid. Excess of sodium carbonate causes a separation of oxychinoline, while phenol is found in solution. It is quite soluble in dilute alcohol, less so in strong alcohol.—Pharm. Ztg., 1892, 429; Am. Jour. Pharm., 1892, 464.

——— Description and properties in Pharm. Centralh., 1892, 444.

Oxyethylmethylphenylpyrazolon is a new derivative of phenyl-methyl-pyrazolon. According to Knorr it is prepared as follows: Equivalent proportions of pyrazolon-sodium and ethylene chlorhydrin, in alcoholic solution, are boiled in a flask connected with a reflux condenser until an alkaline reaction is no longer perceptible. The resulting sodium chloride is separated by filtration, the alcohol by distillation, and the remaining thick oil is treated with water, from which, on cooling, oxyethylmethylphenyl-pyrazolon separates in needles, having the composition, $C_{12}H_{14}N_2O_2 + H_2O$, and melting between 62 and 63° C. If placed in a desiccator over sulphuric acid, it loses its water and concretes into a mass which gradually hardens. This melts between 53 and 54° C., is insoluble in sodium hydroxide solution, but readily soluble in acids.

On account of its insolubility in alkalies, it may be regarded as having a constitution analogous to antipyrine, and the following formula assigned to it:

$$\begin{array}{l} HO(C_2H_4)N{-}N{-}C_6H_5 \\ \qquad\quad | \quad\ \diagup CO \\ CH_3.C{=}CH \end{array}$$

The name oxyethylmethylphenylpyrazolon is misleading; the proper name would be hydroxyethylenmethylphenylpyrazolon.—Pharm. Centralh., 1892, p. 463.

Liquid Oxyphenol (peroxydibenzol) is obtained by replacing, in two molecules of benzol ($2C_6H_6$), 9 atoms of H by an equivalent of the hydroxyl group; its composition is $C_{12}H_{12}O_6$. Giuseppe Reale ascribes to it remarkable physiological action, and has used it successfully in diabetes and

albuminuria. Albumin boiled in water in the presence of a little oxyphenol loses the property of being coagulated by heat.—Riv. Ital. di Terap. e Ig., through Rev. intern. de bibliog. méd., March, 1893, 94; Am. Jour. Pharm., 1893, 230.

Paraldehyde and Metaldehyde.—Decomposition of.—J. Nœger in Ber. d. Chem. Ges., xxv., 3316.

Pental.—Experiments with.—Orvosi hetil., Budapest, 1892, 236; 250. Also, Transl. abstr.; in Pest. med.-chir. Presse, Budapest, 1892, 593–597.

Periodates.—A New Remedy for Cholera.—Claimed to be a mineral substance.—Pharm. Post, 1892, 1209.

Phenuretin.—A new phenol derivative occurring in fine, white silky needles; tasteless, somewhat soluble in hot water and used in migraine in doses 0.50 to 1.0 Gm. twice daily.—Pharm. Post, 1893, 155. (See also, Gyógyász. Kösl nyc, 1893, 192.)

Phenacetine, according to Hinsberg (Bollet. chim. farm., 1892, 72), when finely pulverized and heated to ebullition with nitric acid (1 : 10) shows an orange-yellow color, by which it may be recognized, since antipyrine and antifebrine, treated in the same manner, give no reaction.—Rev. inter. de bibliog. méd., Dec., 1892, 398; Am. Jour. Pharm., 1893, 74.

Phenocoll Hydrochloride.—The nomenclature of this substance is discussed in Notes on New Rem., 1893, 30. The following, according to Chas. Rice, are correct: phenocoll hydrochlorid, salzsaures phenocoll and phenocoll hydrochloride.

——— An antipyretic, antirheumatic and nervine. Dose, 8 to 15 grains; maximum daily allowance, 75 grains.—Ibid., 67.

Phenol-cocaine.—According to the Formulaire des Médicaments Nouveaux, the salt is formed by adding an alcoholic solution of phenol to a similar solution of pure cocaine until saturated. On evaporation, a mass of the consistence of honey is left. A commercial specimen of the substance had a semi crystalline appearance, and had probably been prepared by rubbing together the requisite proportions of phenol and cocaine without the aid of any medium. Wool fat is recommended as the best ointment basis. Internally it may be given in pills or capsules, and it is sometimes used in combination with antifebrin. Dose of phenol cocaine is from one-fourth of a grain to two grains.—Pharm. Jour. and Trans., 1892, 7. See also Aerztl. Rundschau, 1892, 9.

Phenolid consists of 50 per cent. of acetanilid and 50 per cent. of sodium bicarbonate.—Squibb's Ephem., Feb., 1893.

Monochloride of Phenol.—C. Eloy. A pulmonary antiseptic.—Rev. gen. clin. et thérap., 1892, 488; Am. Jour. Med. Sci., 1892, 714.

Tribromphenol, heretofore only used as an intestinal antiseptic, is now proposed by Grimm as a taenifuge in from 5 to 10 doses of 0.1 Gm. to 0.2 Gm. each.—Pharm., Zeit., 1892, 200.

Phenosalyl.—Prepared according to Dr. de Christmas (Médecine moderne, June 30, 1892), phenosalyl is a mixture consisting of phenol, 9 Gm., salicylic acid, 1 Gm., lactic acid, 2 Gm., menthol, 0.10 Gm. In preparing, the first three ingredients are heated until completely liquefied, and then the menthol is added. Phenosalyl is very soluble in glycerin; it dissolves in water in the proportion of 4 to 100. Phenosalyl is used as a disinfectant, being able to sterilize, in aqueous solution, tuberculous expectorations and anthrax cultures.—Am. Jour. Pharm., 1892, 590. See also Am. Jour. Med. Sci., 1893, 688, and Pharm. Post, 1893, 155.

Phenylnaphthylaminesulphuric Acid.—A new patented preparation. For its preparation, see Pharm. Post, 1893, 209.

Phenyl-Urethane is regarded by Dr. Sansoni as twice as powerful an antipyretic as antipyrine. The average dose is 7½ grains.—Phar. Jour. (Aus.), 1893, 50.

Picrol.—Under this name Darzens and Dubois describe an iodo-derivative of resorcinmonosulphonic acid, the salts of which are powerfully antiseptic, but not very poisonous. The potassium salt of this iodized acid is a colorless, odorless, crystalline powder, with an acid reaction and bitter taste, soluble in 5 parts of water, also in glycerin, alcohol, ether, collodion, and alkalies. Picrol contains 52 per cent. of iodine.—Rép. de Pharm., 1892, 343.

Piperazine.—W. Majert and A. Schmidt. The authors correct the erroneous statements which have appeared in several modern text-books regarding the physical and chemical characters of piperazine, $C_4H_{10}N_2$, which have been confused with those ascribed by A. W. von Hofmann and by Ladenburg to the impure substances of like composition discovered by them, and termed respectively diethylenediamine and ethyleneimine, or diethylenediimine.

Piperazine, which was not known in its pure crystalline condition until prepared by them in August, 1890, by treatment of dinitrosodiphenylpiperazine with alkali, is a crystalline substance melting at 104–107° in capillary tubes, although when the melting point is determined on large quantities it is found to be 112°, the differences being due to the hygroscopic nature of the base; it boils at 140–145°. It is very readily soluble in water and alcohol, the aqueous solution having a distinctly alkaline reaction. It is very hygroscopic and readily absorbs carbon dioxide, being thereby converted into the carbonate melting at 162–165°.

Piperazine is especially characterized by the formation of an insoluble pomegranate-red double salt with bismuth iodide and of a dibenzoyl compound melting at 191°.

The basic substance diethylenediamine, prepared by Hofmann by the interaction of ammonia and ethylene bromide, consisted of a liquid mixture of bases boiling approximately at 170°. That this mixture contained

a small quantity of a base identical with piperazine is undoubted, but it was only after piperazine had been prepared from dinitrosodiphenylpiperazine that Hofmann succeeded in identifying it and isolating the pure crystalline product from the mixture, which, besides higher ethylene bases, contained also a number of vinyl compounds.

Owing to the difficulty of purifying small quantities of the base, Ladenburg's experiments with diethylenediamine, obtained by the decomposition by heat of ethylenediamine hydrochloride, were unsuccessful; the product described by Ladenburg as the base was undoubtedly impure piperazine carbonate, as proved by its melting point, 159–163°.—Chem. News, 1893, 108.

——— *New Researches upon the Action of Uric Acid upon.*—W. A. Meisels, in Archiv. f. Medicin, 1893, 364; Pharm. Centralh., 1893, 126.

——— A patented process for its preparation by means of sodium glycol and acid derivatives of ethylenediamine.—Pharm. Jour. Trans., 1893, 2.

——— Chemistry of.—Pharm. Centralh., 1893, 47.

——— *Aromatic Disulphoderivative.*—Chem. Zeit., Abstract, Pharm. Post, 1893, 210.

Piperazine and Phenocollum Hydrochloricum.—George Roe. When dispensed alone, piperazine presents no difficulties. It is very soluble (1 in 4), but being hygroscopic cannot be dispensed in powders. Its strongly alkaline reaction renders it incompatible with alkaloids and iron salts. For incompatibles it has been tested with the following:—Acid tannic, cloudiness and green color; alum, white precipitate; quinine salts and all cinchona preparations, precipitates; ferri sulph., dark green color; liq. ferri perchlor, etc., precipitates; inf. rosæ acid, turns blue; Donovan's solution, pink precipitate; pot. permang and silver nitrate, immediate reduction; sodii salicylas and butyl chlor. hyd. become moist when solid is used, but remain clear if in solution; antifebrin and phenacetin become moist; spts. eth. nit. changes to red color; chloral hyd. solid liquefies; dilute acids apparently have no effect on piperazine. Above certain doses piperazine is incompatible with phenocoll hyd., and is so in any dose if common water be used in place of distilled. Of the decompositions mentioned some are of more interest than others, such as the change of color with spts. eth. nit. and the precipitation on adding mercuric chloride. Piperazine, when required in the compressed form, must not be subjected to much pressure, or an insoluble tablet will be the result.

Phenocoll. hyd. is a salt, the components of which are so loosely combined that there are few chemicals which do not decompose it. With ammonia, caustic alkalies, and alkali carbonates, the pure base phenocoll is precipitated. Numerous experiments were made in order to find what drugs could be dispensed with phenocoll, and it was found that although quinine,

sodium salicylate, antipyrin, butyl chloral hydrate, and potassium iodide can be combined without any apparent decomposition, the same cannot be said of the following chemicals, which when dissolved in water and added to a 1 in 30 solution of phenocoll, give rise to the reaction stated below:—Chloral hydrat. becomes darker; pot. acet., pot. bicarb., pot. brom., pot. cit., pot. sulph., benzoates, alum., sp. am. co., the mixture becomes solid; tr. cinchonæ, precipitates. Liq. hydrarg. perchlor. gives a white precipitate. It is compatible with all dilute acids excepting the nitric and nitrohydrochloric. With these it changes to a red color and deposits a large quantity of crystals. The above list is not intended to represent all the incompatibles; only those have been included which are usually given for diseases for which phenocoll has been recommended.

When desired in the compressed form phenocoll should be mixed with half its weight of sugar. By this addition the tablets are rendered soluble, and are recommended to be taken in a little tea, which it slightly darkens in color. Phenocoll hyd. has been much prescribed with piperazine, and great inconvenience has been caused by its forming a solid with this substance when prescribed in large doses. It can, however, be dispensed as a permanent clear mixture in small doses, such as the following:

℞. Piperazine. ..... gr. iiss.
Phenocoll hydrochloride ..... gr. v.
Aq. dest ..... ℥ j.

Distilled water must be used or the decomposition will not be prevented. Each salt should be dissolved in half the water, and then mixed. If the water be gradually added to the salts previously mixed together, some change seems to take place and render them insoluble. If double the quantity in the above prescription be given, the mixture is decidedly incompatible, and a large quantity of crystals are thrown down. The incompatibility of piperazine with phenocoll hyd. in ordinary doses is unfortunate, for even in the small quantities which can be dispensed without any apparent decomposition, it has been successfully used in cases of rheumatism, etc. As the results of experiments it appears that piperazine and phenocoll hyd. can be dispensed in doses of 10 grains of the former and 15 grains of the latter, if some tincture, preferably that of orange, be added.—Phar. Jour. Trans., 1893, 813.

Piperazine and Phenocoll.—E. H. Gane. It was shown that whether tap or distilled water was employed was immaterial, crystals forming from all but very dilute solutions on standing. These crystals were soluble in hot water, but not in cold, and subsequent experiments proved that double decomposition occurred between the two compounds, phenocoll being precipitated, whilst piperazine and hydrochloric acid were found in the solution.—Ibid., 813.

Pixol is the name applied to a water-soluble form of wood-tar. It is

prepared by warming 3 parts of wood-tar and 1 part of green soap together, and gradually adding, with constant stirring, 3 parts of a 10 per cent. solution of potassium hydroxide. Sodium hydroxide is not so well suited for the purpose. Pixol is a clear, dark-brown fluid, of the consistency of a thick syrup. Its aqueous solution is not greasy, and hence will not soil the sides of vessels or linen. It is not caustic, as a 5 per cent. solution contains only about 0.4 per cent. of free alkali. When kept long it sometimes becomes lighter in color, but again assumes a dark-brown color when heated in a water-bath; the change in color does not alter its solubility or disinfecting properties. Its solutions only suffer decomposition, becoming turbid after some weeks' standing and losing greatly in disinfecting power. The disinfecting power of a 5 per cent. solution is not less than that of a 5 per cent. solution of carbolic acid.—Pharm. Zeit., 1893, 167.

Pyoktanin—Injections of.—Results of Pelterute and Mirto in Ref. Med.; Nouv. Rem., 1892, 479.—Am. Jour. Pharm., 1893, 17.

Pyrozone is the name applied to a solution containing about 50 per cent. of hydrogen dioxide in ether. It is a potent and efficient oxidizer, intended for external use only.—Pharm. Post, 1892 1288. Also Pharm. Zeit., 1892, 743.

"*Resorcinol.*"—This name is given by Biélaïew to a compound yet ill-defined chemically, which he obtained by heating together to the point of fusion equal parts of resorcin and iodoform. It is described as an amorphous, coffee-colored substance, of an iodine-like odor and a taste recalling that of iodoform. It has been employed in the treatment of chancres, ulcers of the leg, malignant wounds, and various cutaneous affections (scabies, psoriasis, eczema, lichen, etc.). A valuable property claimed for resorcinol is that it very rapidly allays the itching. Applied to ulcerated surfaces the new medicament provokes a quite violent burning pain; it can, therefore, not be applied pure, save on gangrenous or very atonic wounds. For all other cases it should be mixed with starch (1 : 1–4), or lard (1–2 : 15). Vaselin mixes poorly with resorcinol, and can consequently not be used for the preparation of the ointments. It is unfortunate that the author should have chosen the name resorcinol,* which happens to be a synonym of resorcin. This is certain to lead to confusion in the drug trade, and it will be difficult for wholesalers to tell what is wanted when resorcinol is called for.—Merck's Rep.; Pharm. Review, 1893, 51.

Phenolsulphoricinate.—This preparation is made by dissolving 4 parts of sodium sulphoricinate in 1 part of phenol. The principal ingredient is the same as that of the substance known under the trade names of solvin, polysolve, and sulpholricinate, and for several years used therapeutically in Ger-

* Resorcinol is the new name adopted by the American Association for the Advancement of Science, in place of "resorcin," and should not be confounded with the above.

many. According to Berlioz it is valuable in diphtheria. The high toxicity of solvin, demonstrated as long ago as 1887 by Kobert (Therapeutische Monatshefte, 1887, No. 12), renders its use in this direction a matter of extreme caution. The active principle (existing to the extent of from 30 to 40 per cent. in sodium sulphoricinate) is the sulphuric ester of ricinoleic acid, which, even in solutions of from 2,000 to 5,000 parts of solvent to 1 part of the ester, completely dissolves the red blood corpuscles, and, consequently, is deadly to the human organism, and exactly in the same manner as the bodies of the saponin group. As Kobert's experiments and determinations have not yet been controverted, it will be seen that the greatest caution must be observed in the use of this solvin solution of phenol.—*Pharm. Post*, 1892, 1286.

Diiodothioresorcin is a brown amorphous powder, insoluble in water, soluble in alcohol and used as an antiseptic.—Merck's Rep.

Resorcylalgin.—On mixing β-resorcylic acid and analgesin, a precipitate is formed which is soluble in alcohol and slightly so in water, and forms with the alkaline bases soluble salts (resorcinalginates.) The ammonium salt is very soluble in water and has a saccharine taste.—A. Petit, in Jour. de Pharm. et de Chim., March, 1893, 294.

Saccharin Refined.—It is now placed on the market by a foreign manufacturer, who claims to have devised a method by which, on a manufacturing scale, the true saccharin or anhydro-ortho-sulphaminbenzoic acid can be separated from the para-sulphaminbenzoic acid, at present constituting 40 per cent of the purest saccharin of commerce. While common saccharin is about 300 times as sweet as sugar, the refined article is claimed to be 500 times as sweet.—Pharm. Post, 1892, 768.

——— *in Preserves.*—Meyer Bros. Drug., 1893, 127.

Salacetol.—Under this name salicylacetol is brought into the market. It is used in summer diarrhœa n dose of 2–4 Gm. daily in castor oil — Pharm. Centralh., 1893, 236.

Salicylacetol.—Obtained by the reaction of monochloracetone and sodium salicylate. Salicylacetol crystallizes in long needles: it melts at 71° C., is insoluble in cold water, very sparingly soluble in hot water, readily so in warm alcohol, ether, or chloroform. It is very readily saponified by contact with ammonia or dilute solutions of caustic alkali.—P. Fritsch, in Pharm. Centralh., xxxiv., 194.

Salicylacetic Acid is formed by the action of disodium salicylate upon sodium monochloracetate. It occurs in lustrous laminæ, melts at 188° C., and is very difficultly soluble in cold water, ether, chloroform and benzol, easily soluble in boiling water and alcohol. The antipyrine salt of this acid (melting point 145 C.) made by the combination of one molecule of each, is claimed to have certain advantages over salipyrine because of its stronger antiseptic action.—Ibid., 41.

Salicylamide.—W. R. Nesbitt obtained it in the form of perfectly colorless, thin, transparent, plate-like crystals, moderately soluble in water. It is quite tasteless and leaves a grittiness in the mouth. A substitute for salicylic acid.

——— *Doses of.*—15 centigrams hourly, or 25 centigrams every three hours. The maximum dose for twenty-four hours is one gram, which should not be exceeded.—Bull. Pharm., 1892, 611.

Salicylic Acid—Orthoamido.—Pharm. Post, 1892, 1220. This new antirheumatic is salicylic acid, in which an atom of hydrogen has been replaced by one of NH_2. It is a whitish gray, amorphous, almost odorless powder, insoluble in water, alcohol and ether, and has a sweetish and not unpleasant taste.

Salipyrin—Its Use in Medicine.—A summary of its chemical and physical properties and therapeutical properties and uses.—Notes on New Rem., 1893, 121.

Salokoll, the trade name for phenocoll salicylate, has some therapeutic advantages over the hydrochlorate. It is claimed to be a trustworthy antipyretic, antineuralgic and antirheumatic, in doses of one to two grams. —Pharm. Ztg., 1893, 160.

Salol—Preparation of.—According to Ernert (Rép. de Pharm., August, 1892) nearly the theoretical quantity of salol is obtained by heating salicylic acid to between 160° and 240° C., and preventing access of air, while water is being disengaged. Salicylic anhydride is probably formed during the operation, and by its decomposition phenol is produced, which combines with unaltered salicylic acid to form salol.—Am. Jour. Pharm., 1892, 570.

——— *Reaction of.*—According to *Jour. de Pharm. d'Anvers*, where a small quantity of salol is added to a few drops of nitro-sulphuric acid, the mixture is colored yellow and on stirring with a glass rod it changes to brown and then to green; on diluting with about 50 gm. of water the liquid assumes a rose color, the green color reappearing on adding ammonia. Resorcin treated in the same manner gives a deep blue color; on dilution, red. In the latter solution, ammonia causes the blue color to reappear.—*Pharm. Era.*

——— *Elimination of.*—P. Cornet, in Le Prog. Med.—Chem. and Drug., 1893, 757.

——— *Action of Pancreatic Juice on.*—Gley in Soc. de Biologie; Rép. de Pharm., 1892, 230. Abstract in Am. Jour. Pharm., 1892, 404.

Salophen (*Acetyl-para-amido-salol*), patented. It is prepared by mixing equal parts of para-nitro-phenol and salicylic acid. It occurs in small thin laminar crystals, odorless, tasteless, and with a neutral reaction. It is practically insoluble in water.

——— Dr. Caminer administers it in 15 grain doses, every two hours, up to the daily amount of 90 grains in acute articular rheumatism.—Therap. Monatsh., 1892, 519; Am. Jour. Med. Sci., 1893, 88.

——— *Pharmacological Investigation of.*—W. Siebel, in Amer. Pract. and News, 1892, n. s., 14, 261. (See also, Merck's Bull., Oct., 1892; Squibb's Ephem., Feb., 1893.)

"*Sanitas*" Disinfecting Fluid.—It is an aqueous solution of turpentine, which has been oxidized by exposure to air. It contains some camphor in solution, thymol, hydrogen dioxide and a small proportion of camphoric acid. The proportion of the latter, however, is so small that it is hardly proper to claim, as some do, any special efficiency of the fluid as due to this acid.

The fluid has many combined advantages. It is a good oxidizing agent and antiseptic, is not poisonous, and does not soil clothing when poured upon it. Squibb's Ephem., Feb., 1893.

Saprol, also called *disinfection-oil*, consists of a mixture of crude cresols containing considerable quantities of pyridine bases and hydrocarbons which presumably are obtained from a petroleum refinery; the addition of hydrocarbons is such that a mixture results which floats upon water.—Pharm. Centralhalle, 1892, 305.

Sedatin, a new patented sedative, is chemically para-valerylphenetidine manufactured by the action of phenetidine hydrochlorate upon sodium valeriate; instead of valeric acid or its sodium salt, valeryl chloride or valeric anhydride may be utilized. The product crystallizes in fine needles, boils at 350–360° C., and is only slightly soluble in benzin, ether, chloroform, acetone and cold ethyl and methyl alcohols, quite soluble in the last two solvents when hot.—Rundschau, 1893, 497; Amer. Jour. Pharm., 1893, 330.

Liquor Sodii Chloroborosum.—Rüger in Pharm. Post, 1892, 1071.

——— Kottmayer concludes that it is nothing more than a solution of ordinary borax and salt with chlorine gas.—Ibid., 1002 and 1192.

——— Continuation of discussion by Rüger and Kottmayer.—Ibid., 1893, 89–92, 113.

Sodium Chloroborosum.—C. Rüger's.—R. Ebert. Wien. klin. Wochenschr., 1892, 715.

——— in Practice.—A. Laab.—Med.-Chir. Centralb., Wien, 1893, 1–3.

Sodium Ethylate, prepared by acting with sodium upon alcohol at 50° C., is stated to exert a favorable influence upon certain cutaneous affections. Prof. Gamberini, of Bologna, and Dr. Maroni (*Semaine Médicale*) have used a two per cent. solution of this compound in olive oil as a lotion in a case of psoriasis, which completely disappeared in twenty days. By applying under a protective covering an aqueous solution of 10 per cent.

sodium ethylate, very favorable results were observed in Paget's disease, erythematous lupus and in torpid ulcers of various origin.—Amer. Jour. Pharm., 1892, 571.

Sodium Paracresotate in infantile diarrhœa.—According to Demme and Loesch (Rev. gén. de Clin. et de Thér., 1892) sodium paracresotate acts as an internal antiseptic, disinfecting the stools and diminishing their frequency. The maximum doses are the following: under two years of age, 50 Cgm. per day; to four years, 1 Gm.; to ten years, 3 Gm. It should be prescribed in small doses and gradually increased.—Am. Jour. Pharm., 1893, 74.

Sodium Salicylsulphonate.—Pharm. Post, 1892, 1220. This new antirheumatic occurs as a fine crystalline, odorless substance, having a sour and somewhat astringent taste. It is easily soluble in water, but almost insoluble in ether and alcohol. Its formula is obtained by replacing a hydrogen atom of salicylic acid with one of SO_3Na.

Sulphoricinate of Sodium.—A. Berlioz prepares this salt as follows: To one Kgm. of castor oil, 250 Gm. of pure sulphuric acid of 66° B. are added in small quantities and with constant stirring, to avoid any rise in temperature. Set aside for 12 hours and add 1,500 Gm. cold water; agitate and remove the aqueous layer, which gradually separates. Then to remove excess of sulphuric acid, wash a number of times with water, which contains 100 Gm. of table salt per liter, and which has previously been heated to 60°–70° C. Carefully add, under constant stirring, soda lye to a feebly acid reaction; let stand for two or three days, decant and filter.

Sulphoricinated phenol, used for the treatment of diphtheria (see Proc. 1891, 577) and prepared with sodium sulphoricinate, made in the manner indicated, will retain its transparency at ordinary temperatures.—Jour. de Pharm. et de Chim., 1893, 10.

Sulphoricinic Acid is a yellowish fluid, easily soluble in water and in alcohol; its solutions foam when shaken, have a scratchy taste, and, like the acid itself, decompose upon standing for a long time, sulphuric acid being formed.—Merck's Bull.

Sulphosalicylic (Salicylsulphonic) Acid.—Merck's Bull. Occurs as white crystals; readily soluble in water and in alcohol. It has been recommended as a reliable and extremely sensitive test for urine-albumin.

Sodium Tetraborate is the name which has been given to the comparatively new preparation obtained by the combination of equal parts of sodium diborate (borax), boric acid, and water. Heat is applied to complete the reaction, and upon cooling the new salt (?) is found to be neutral, thus apparently verifying the formation of an entirely new compound.

This salt (?) was introduced to furnish a more soluble form of boric

acid, as it has been well known for some time that the solubility of boric acid was greatly increased by simply adding borax.—Squibb's Ephem., Feb., 1893.

Solveol.—A new antiseptic.—Zeits. Oest. Apoth. Ver., 1892, 759.

Somatosen.—A new preparation distinguished by containing a small amount of peptone (Kuhne's) and a large amount of albumose (84–86 per cent.). It is free from an unpleasant taste and offensive odor.—Pharm. Centralh., 1893, 236.

Sozal is aluminum paraphenolsulphonate obtained by either dissolving aluminum hydrate in paraphenolsulphonic acid, or by double decomposition of aluminum sulphate and barium paraphenolsulphonate. It is brought upon the market in the form of crystalline grains of weak phenol odor, but strongly astringent taste; easily soluble in water, glycerin, and alcohol, forming permanent solutions. In the clinical experiments very good results were obtained by its use as an antiseptic, although the bacteriological experiments were found to contradict this; attention is called to the case of iodoform, where the same contradictory status exists.—Schaerges, Pharm. Ztg., 1892, 489.

Sozo-Iodol (Diiodoparaphenylsulphonic Acid).—Outline of manufacture in Squibb's Ephem., Feb., 1893. It contains about 54 per cent. of iodine, 20 per cent. of carbolic acid, and 7 per cent. of sulphur. The ammonium, lead, mercury, potassium, sodium and zinc salts of this acid are the agents mostly employed, being recommended as substitutes for iodoform on account of their complete lack of odor. The sodium salt, however, is the one most favored so far, and is seen in bright needle-like crystals, somewhat prismatic in form. A five to ten per cent. solution of this salt in water is found to be about the most suitable limit.

Sozoiodol-Mercury dissolved in a solution of potassium iodide, has been used hypodermically. F. Riederer observes that it is not entirely soluble in a solution of potassium iodide, but leaves a dark gray residue consisting mainly of mercury, and mercuric iodide is found in solution. Sozoiodol of mercury should, therefore, not be used in this form.—Chem. Ztg. Rep., 1893, 69, from Pharm. Zeitschr. Russl.

Spermine—Chemical Analysis of. A. Pohl.—J. russk. fiz.—Chim., Obsh., St. Petersb., 1891, 151.

——— *A Reaction of.* Duclaux in Compt. rend., 1892, 155.

——— *in Intra Organic Oxidations.*—The part played by.—A. Poehl. Compt. rend., Oct. 10, 1892.

Sucrol.—See Dulcin. Sucrol, the trade name finally adopted for *p* phenetol carbamide was noted in the Am. Jour. Pharm., 1892, 611; it is best adapted for its uses in a fine crystalline form. It melts at 160°, is soluble in alcohol, ether, hot hydrochloric and acetic acids; 100 C.c. water at 20° dissolve 0.16 Gm., at 80° 0.65 Gm.; it has about 200 times the sweeten-

ing power of sugar. There is some difficulty in moistening the *powdered* sucrol, but this is overcome by using it in minute crystals; used for sweetening liquids, like tea, coffee, etc., the hot liquids should be poured on the sucrol previously placed in the cup. In pharmaceutical use as a sweetener, sucrol has not the power of overcoming the intensely bitter taste of drugs; a solution containing quinine sulphate 1.0, sulphuric acid six drops, distilled water 100.0 and sucrol 0.1 tastes intensely bitter, acid and sweet at the same time; in a powder containing morphine hydrochlorate 0.05, starch 2.50, and sucrol 0.05, the bitter taste is disguised better than is possible with sugar; in substituting sucrol for sugar as in the above formula, some inert powder must be introduced to make up the quantity. Physiological experiments by Dr. Paschkis proclaim sucrol a harmless substance, it not interfering with digestion, respiration or circulation; administered for some time the urine remains normal, traces of sucrol are only to be found in it after taking large doses (0.5 or more). As a test for sucrol, Dr. Berlinerblau boils for a short time a small quantity in a test tube with 2–3 drops each of carbolic and sulphuric acids; after cooling, the syrupy red liquid is poured into half a test-tubeful of water, thoroughly mixed and then either sodium or ammonium hydrate solution added in such a way as to form a distinct layer without mixing; at the line of contact there is first produced a blue ring, which intensifies upon standing and later spreads throughout the alkaline solution; using sodium hydrate the color has a tinge of violet, with ammonium hydrate a pure blue. In complex mixtures the sucrol should first be extracted with ether and the ether-residue used.—(Therap. Blaetter) Oesterr. Ztschr. f. Pharm., 1893, 261; Am. Jour. Pharm., 1893, 288.

Sucrol—Sensitive test for.—Traces of sucrol evaporated in a small capsule with several drops fuming nitric acid leave, after a violent reaction, an orange colored, resinous mass, soluble in alcohol, chloroform and ether; if the residue be mixed with a glass rod, with two drops each of liquefied carbolic acid and concentrated sulphuric acid, an intense blood-red color is produced, not fading for a considerable time; the mixture is soluble in chloroform, with a beautiful red color, but this fades rather quickly.—Dr. N. Wender, Pharm. Post, 1893, 269.

Sulfaminol (Thiooxydiphenylamin), a bright yellow powder, without taste or odor, used as an antiseptic.—New Rem., 1892, 87.

Sulphume (so-called "Pure Liquid Sulphur") is a preparation introduced by a Western firm as a "cure-all" for "diphtheria, ulcerated throats, open sores and ulcers, skin diseases, rheumatism and other affections," which proves to be little else than an aqueous solution of some of the higher sulphides of sodium and potassium saturated with sulphur. Sulphides of calcium and magnesium are present in small amounts, probably as impurities.—Squibb's Ephem., Feb., 1893.

Sulphonal—Poisoning by.—A man who took 240 grains of sulphonal in five doses during two days, died on the evening of the following day.—Med. and Surg. Repr., 1892, 66.

Tetrathiodichlordisalicylic acid ($C_6HCl(OH)CO.OH)_2S_4$ made by slowly heating 27.6 salicylic acid with 55.0 sulphur chloride to 120°C. and later to 140°C., is stated to have antiseptic properties; it softens at 150°C. and at 160°C. is completely melted.—Pharm. Centralh., 1892, 648; Am. Jour. Pharm., 1892, 610.

Thiodinaphthyloxide.—Pharm. Centralh., 1892, 714. It is an odorless orange-colored substance, which is insoluble in water and cold sodium hydrate solution, difficultly soluble in alcohol, readily soluble (on heating) in glacial acetic acid, ether, benzol, toluol, chloroform, acetone, methyl and amyl alcohol.

Thiol.—Remedy for burns.—Pharm. Centralh., 1892, 466.

——— in skin diseases.—Notes on New Rem., 1893, 25.

Thiolinic Acid.—A compound prepared from linseed oil and sulphur. It is a dark greenish-brown amorphous mass, friable in the cold, and containing about 14.2 per cent. of sulphur.—Pharm. Era; from Apoth. Zeit.

Thiophendiiodide is recommended as an efficient antiseptic, possessing all the advantages of iodoform without producing irritation of the skin. It has an aromatic odor, and is non-poisonous.—Chem. and Drug., 1893, 841.

Thiosalicylic Acid is recommended to be used medicinally for the same purposes as salicylic acid; patents have been applied for a process of preparing it from anthranilic acid by converting this into *o*-diazo-benzoic acid, treating with hydrogen sulphide, then with sodium carbonate or hydrate, and supersaturating with hydrochloric or sulphuric acid. On oxidation it gives at once ortho-sulpho-benzoic acid free from isomers, and therefore important in the manufacture of the sweet substance, saccharin.—C. Graebe, Apoth. Zeit., 1892, 359.

Thiosinamin, or *allyl-sulpho-carbamide*, occurs in the form of a crystalline body, obtained by heating together two parts of allyl, mustard oil, one part of absolute alcohol, and seven parts of spirit of ammonia, and subsequent concentration by means of a water-bath. It has been used by Hebra (Monat. f. prakt. Dermatol., 1892, No. 7,) in the treatment of various cutaneous affections. The remedy is employed hypodermatically in the form of a 15 per cent. alcoholic solution, the dose ranging from five to thirty minims twice a week, the initial dose being small until toleration is established.—The Am. Therap., 1893, 190. See also Chem. Zeit., 1892, No. 28.

Thiuret and its paraphenol-sulphonate.—The first of these, $NC_6H_5CSH.NH.CSH.NH$, a bulky, odorless, crystalline powder, insoluble in

water, soluble in alcohol and ether, is offered as an antiseptic to be applied in the form of powder, its action depending upon the liberation of sulphur, cold dilute alkalies easily decomposing it. Of the salts which act more rapidly because of their greater solubility, the one mentioned above is the most suitable, as it can be used in 0.3 or 0.4 per cent. aqueous solution. In the pure form it is a yellow, crystalline, odorless powder, having an intensely bitter taste.—Pharm. Zeit., 1893, 137; Amer. Jour. Pharm., 1893, 226; Also Apoth. Zeit., 8, 108.

Thymacetin.—This substance has been recommended by Jolly as a neuralgic. It is readily soluble in alcohol, sparingly so in ether, and almost insoluble in water. It is probably derived from thymol by the substitution of ethyl for the hydrogen of hydroxyl and of an acetylated amido group for an atom of hydrogen in the nucleus. Pharm. Centralb., 33, 715.

Tolyantipyrin Derivatives.—Ebert describes the following in Pharm. Zeit., 1893, 251; Pharm. Post, 1893, 249: Tolyantipyrinchlorhydrat, Isonitrosotolylantipyrin, Tolylhypnal (Chloralhydrat-tolylantipyrin), Chloraltolylantipyrin, Ferric chloridtolylantipyrin, Monobromtolylantipyrin, Monojodtolylantipyrin.

Tolypyrin.—A derivative of antipyrin is *p*-tolyl-dimethylpyrazolon, and differs from antipyrine by containing an additional methyl group introduced into the phenyl radical. This compound unites with salicylic acid just as does antipyrine (to form salipyrine) and the resulting salt is commercially called *tolysal;* it forms colorless crystals melting at 101°–102° C., difficultly soluble in water, but easily soluble in alcohol.—Phar. Ztg., 1892, 750 and 764.

——— forms colorless crystals, melting at 136–137°, soluble in 14 parts of water, very soluble in alcohol. It has a very bitter taste. Towards ferric chloride and nitrous acid it reacts like antipyrine. As an antipyretic, four grams are as effective as 5–6 grams antipyrine.—Pharm. Ztg., 1893, 183; Am. Jour. Pharm., 1893, 287.

Tolysal.—See Tolypyrin.

——— in rheumatism.—Chem. and Drug., March 18, 1893.

Tolypyrin and Antipyrine—Distinguishing Tests.—The following tests will indicate mixtures of the two: (1) Tolypyrine in two per cent. solution will give a precipitate with an excess of sodium hydrate; antipyrine solutions must contain at least five per cent. in order to precipitate with this reagent; (2) The melting point of antipyrine is 113°, of tolypyrine 136–137° C.; mixtures containing 10, 25 and 50 per cent. tolypyrine show the same melting point of 94° C.; with 75 per cent. tolypyrine the greater portion melts at 94°, but complete liquefaction requires 120°; with 90 per cent. tolypyrine the mixture gradually melts between 100° and 130°.—Pharm., Zeit., 1893, 192.

Trional (Diethylsuphon-methylethylmenthan). A. Boettiger has administered this remedy successfully in doses from 15–60 grains as a powder two or three times daily, the last being at bed-time. It is apparently as effective in one-third the dose as chloralamide or amylene hydrate.—Berlin. klin. Wochenschr., 1892, 1045; Am. Jour. Med. Sci., 1893, 87.

Tumenol.—A. Neisser recommends it as an anti-pruritic. It is obtained from mineral oil by the action of sulphuric acid, and while similar, is different from ichthyol.—Deutsch. Med. Wochenschr., 1891, No. 45; Am. Jour. Med. Sci., 1892, 232.

Ulyptol is a mixture of salicylic and carbolic acids and eucalyptus oil used by Chatelain in the treatment of wounds.—Zeits. Oest. Apoth. Ver., 1893, 414.

Urcedin, used in gout and rheumatism. Composition, according to Goldman (Pharm. Zeit.), is probably sodium sulphate, 30 parts; sodium carbonate, 10, and sodium citrate, 60.

Urson has been studied by W. Gintl, who finds its melting point to be 265° C.—Chem. Zeit., xvii., 436.

Valzin, a Rival of Saccharin.—It is claimed to be 200 times sweeter than sugar, and free from certain objectionable properties of saccharin.—Am. Therap., 1893, 313.

Xylenolsalol.—A new patented preparation. In physical and chemical properties it is similar to the known salols. It is insoluble in water, soluble in alcohol and ether, as in sodium hydrate. It is colorless, neutral, and without a strong taste or odor. It is particularly recommended as a disinfectant.—Pharm. Zeit., 1893, 200.

Zinköl.—According to Lassar (Rund., xix, 145) Zinköl is a soft paste of oxide of zinc and olive oil, which is made softer or harder by lessening or increasing the quantity of oxide of zinc. The usual proportions are:

Oxide of zinc	30 parts.
Olive oil	50 parts.

GENERAL.

Pharmaceutical Statistics.—According to Pharm. Rund., 1892, 273, there are at present in this country 34,886 retail druggists, 354 wholesale druggists, and 5,623 manufacturers of pharmacal products, specialties and nostrums, an average of one retail druggist for about 1860 inhabitants. In France the ratio is one to 5,357; in Germany (where the practice of pharmacy is under control of the government) 1 to 10,300; in Italy, 1 to 2,800, and in Switzerland 1 to 5,500. In the larger cities of Germany the conditions are yet more favorable; thus Berlin has but one pharmacy for every 11,600 inhabitants, Breslau one for every 13,600, Dresden one for every 13,000, Leipzig one for every 12,000, etc.

Retrospect of Pharmacy for 1892.—A. Schneider in Pharm. Centralh., 1893, 1, 15, 31.—Editorial in Chem. and Drug., 1892, 926.

Pharmaceutical Progress.—An account of the principal events and progress of the Pharmaceutical Society of Great Britain for the year 1892.—Pharm. Jour. Trans., 1892, 525.

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Institutions Teaching Pharmacy in North America.—With reference to requirements for admission and graduation arranged in a tabular form. From Hallberg's Pharmacal Calendar.—West. Drug., 1892, 358.

American Colleges of Pharmacy.—Illustrated article upon the Minnesota College of Pharmacy.—West. Drug., 1893, 84. School of Pharmacy of the University of Michigan.—Ibid., 1893, 130. Philadelphia College of Pharmacy.—Ibid., 1893, 174. Kansas School of Pharmacy.—Ibid., 1893, 220.

Colleges and Schools of Pharmacy.—P. W. Bedford.—Pharm. Record, 1892, 3.

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The Pharmacy of the Minor Syllabus.—Joseph Ince. The reason for, and explanation of the official Syllabus of Minor Examination.—Pharm. Jour. Trans., 1892, 421.

Education and Examination—Preliminary.—C. Schmidt.—Nat. Drug., 1892, 35.

Botanical Names in State Board Examinations.—Editorial, Apothecary, Aug., 1892.

Is Latin Necessary to Pharmacy?—Views of 13 teachers.—Merck's Report, July, 1892; Oldberg, Apothecary, Aug., 1892.

Physiology and Pharmaco-Dynamics in Schools of Pharmacy.—R. H. Brown.—Apothecary, Aug., 1892; Editorial, ibid., 23.

Queries and Pharmaceutical Meetings.—Pharm. Rund., 1893, 125.

Short Cuts to Knowledge and Proficiency.—An article condemning the use of "quiz compends," "lecture notes," "syllabus of pharmacy course," "essentials of pharmacy," etc.—Pharm. Rund., 1893, 108.

The Future of Pharmacy.—A paper by Graves Aickin, read before the Chemists' and Druggists' Association.—Phar. Jour. (Aus.), 1892, 319.

——— A Reply.—T. E. Turner.—Ibid., 382.

Examination Questions of the *Brooklyn College of Pharmacy.*—Amer. Drug., 1893, 303.

——— of the *California State Board of Pharmacy.*—The Pacific Drug., 1893, 10, 191; Pharm. Record, 1892, 328; West. Drug., 1892, 319.

Examination Questions of the Louisiana Board of Pharmacy.—Pharm. Era, 1893, 382 ;Drug. Circ., 1893, 92.

——— of the *Nebraska Board of Pharmacy.*—Drug. Circ., 1893, 21.

——— of the *College of Pharmacy of the City of New York.*—Amer. Drug., 1893, 351 ; Drug. Circ., 1893, 138.

——— of the *North Carolina Board of Pharmacy.*—Pharm. Record, 1893, 269 ; Pharm. Era, 1893, 55 ; Meyer Bros. Drug., 1892, 294 ; West. Drug., 1893, 38.

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——— of the *Pennsylvania State Board of Pharmacy.*—Drug. Circ., 1893, 69.

——— of *Philadelphia College of Pharmacy*, in Am. Jour. Pharm., 1893, 248–256 ; Drug. Circ., 1893, 115.

——— of the *State Board of Pharmacy of South Dakota.*—Proc. of Seventh Annual Meeting of S. Dakota Pharm. Assoc., 1892, 92–108. I. A. Keith, Secretary, Lake Preston.

——— *of the Washington State Board of Pharmacy.*—Meyer Bros. Drug., 1892, 382.

Educational Information of Great Britain.—A summary of the legal conditions for the practice of Pharmacy, Medicine, Dentistry and Veterinary Surgery, with particulars of practical knowledge, education and examinations required therein. Also statements regarding education and examinations in Science and in Agriculture and Honors in Pharmacy.—Chem. and Drug., 1892, 429–457.

Pharmaceutical License Examination Questions.—Chem. and Drug., 1892, 69.

Examination Questions in Edinburgh (Major).—Pharm. Jour. Trans., 1892, 76 ; 1893, 558.

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——— *in London* (First Examination).—Pharm. Jour. Trans., 1892, 312 ; Chem. and Drug., 1892, 574 ; 1893, 41, 511.

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——— of the *Pharmacy Board of New South Wales.*—Aus. Jour. of Pharm., 1892, 402; 1893, 19.

——— of the *Pharmacy Board of New Zealand.*—Aus. Jour. of Pharm., 1892, 194 and 372; 1893, 153.

——— of the *Board of Pharmacy of South Australia.*—Aus. Jour. of Pharm., 1893, 131.

——— of the *Pharmaceutical Society of Tasmania* (Major Examination).—Aus. Jour. of Pharm., 1892, 277.

——— of the *Pharmacy Board of Victoria* (Preliminary).—Aus. Jour. of Pharm., 1892, 203 and 344; 1893, 95.

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Arabians in the 13th Century—Simple Medicines of.—E. Sickenberger.—Pharm. Post, 1892, 953, etc.

Austrian Pharmacy in the Last 25 Years.—A contribution to the history of.—Pharm. Post, 1892, 1306.

Bombay Drug Bazaar.—An illustrated account by T. Stephenson.—Chem. and Drug., 1893, 102.

Druggists' Shops in Calcutta.—Chem. and Drug., 1892, 508; from Indian Med. Record.

Medicines in England 200 Years Ago.—F. Haselstein.—Pharm. Post, 1893, 53.

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German and Venetian Pharmacists—The Comparative Standing of.—F. A. Flückiger.—Pharm. Zeit., 1892, No. 31.

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Lyon—Pharmacy from the 16th Century.—J. Vidal in Bull. de Pharm. de Lyon, 1891–92, 105, 153, 185, 217, 289, 321.

Pharmacy in Marseilles.—R. J. Blackham.—Brit. and Col. Drug.; Drug. Circ., 1893, 64.

Importation of Drugs, Chemicals, Dye Stuffs, etc., into Mexico.—U. S. Consul Fechet.—Pharm. Era, 1893, 281.

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Middle Ages.—Pharmacy and Medicine of, with particular reference to the A(u)reolate of John St. Amand (13th century).—Pagel in Pharm. Post, 1893, 125, etc.

Apothecaries and Medicines of the Middle Ages in France.—Pharm. Post, 1892, 789, etc.

Pharmacy at Nice.—Chem. and Drug., 1893, 514.

Niger—Five Hundred Miles up the.—T. Christy's account of Kola trade, Strophanthus, Patchouly, Elemi and Acacia.—Chem. and Drug., 1893, 156.

Pharmacy in Norway.—E. J. Millard.—Brit. and Col. Drug.; Drug. Circ., 1893, 129.

Modern Persian Remedies.—A Contribution to the Knowledge of.—A. J. Ceyp.—Pharm. Post, 1892, 873, etc.

Pharmacy and the Drug Business in Peru.—U. S. Consul Dougherty.—Nat. Drug., 1893, 139.

Pharmacy in Port Said.—R. J. Blackham.—Brit. and Col. Drug., 1892, 254.

Russia—History of the Management of Affairs of the Apothecary in.—Pharm. Post, 1892, 1117, etc.

Russian Pharmacy—Nationalities in.—Editorial, Chem. and Drug., 1893, 485; E. Polack, 525.

Manufacture of Sulphuric Acid and Alkali in Russia.—A Bowman.—Chem. and Drug., 1893, 508.

Transvaal—Pharmacy in the.—Chem. and Drug., 1893, 821.

Vienna Alchemists of the 17th and 18th Centuries.—I. Schwartz.—Pharm. Post, 1893, 233, etc.

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English Pharmacies Abroad.—Australia, Baden-Baden and Italy.—Chem. and Drug., 1893, 696.

Six Months of Foreign Pharmacy.—Walter R. Mitchell. An account of the author's sojourn in Italy.—Pharm. Jour. Trans., 1893, 473.

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Italian Pharmacopœia—The New.—A reprint with abstract of contents and translation.—Pharm. Post., 1892, 669, 689. Also Pharm. Centralh., 1892, 619, etc.

Suggestions for a Revised Pharmacopœia.—M. Charteris.—Phar. Jour. Trans., 1892, 411.

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Metric System—Practical Helps in the Use of.—C. O. Arey.—Pharm. Record, 1893, 268; from Med. News.

——— Views of different writers in Meyer Bros. Drug., 1892, 292, 334, 339; 1893, 16, 114.

Metric System in Prescription Writing—Aids to the Adoption of the.—E. H. Long.—Medical News, March, 1893; Bull. Pharm., 1893, 147.

The Pound Weight and its History.—F. H. Taylor in Mech. News.—Pharm. Era, 1893, 52.

Our Weights and Measures.—Editorial, Apothecary, Dec., 1892.

Where is the Litre?—A Modern Scientific Puzzle Picture.—S. H. Emmens.—Science, 1893, 141 and 234; T. C. Mendenhall (ibid.), 219.

Weights and Measures in England versus the Decimal and Metric System.—J. J. Cousins.—Science, 1892, 298; W. P. Mason (ibid., 358); T. C. Mendenhall (ibid., 1893, 79).

U. S. Gallon of Water—Weight of a.—Comparison of authorities by W. P. Mason and views of Dr. Rice.—Pharm. Record, 1893, 24.

The Metric System in Foreign Lands.—The following list shows the countries which have adopted the metric system, their total population being 420,350,186. This system is not used as the standard in any English-speaking countries:

Norway and Sweden, Denmark, Iceland and Greenland, Danish West Indies, Germany, Holland, Java, etc., Belgium, France, French colonies and protected countries, Ottoman Empire, Mexico, Central America, Hayti, Colombia (Republic), Venezuela, Ecuador, Brazil, Uruguay, Argentine

Republic, Portugal, Azores and Madeira, Spain, Canary Islands, Colonial possessions, Italy, Italian dependencies, Austrian territories, Greece, Roumania, Chili, Peru, Japan, Switzerland, Finland (Russian Grand Duchy), Mauritius and dependencies, Servia, Bolivia, Republic of St. Domingo, Egypt.—Meyer Bros.' Drug., 1893, 48.

DISPENSING.

Ruled Prescription Blanks.—Dr. Cyrus Edson suggests the following design:

R	♎	℥	ʒ	Grs.	Mins.

—Drug. Circ., 1893, 29.

Germany—Medicine Prices in.—B. W. Petsche.—Pharm. Era, 1993, 438.

Dispensing Charges in Italy.—The new Italian pharmacy law has established an official retail price-list for drugs, which has just come into operation. The list gives the maximum figures which a pharmacist is allowed to charge for all the drugs mentioned in the Pharmacopœia, as well as for the dispensing of prescriptions. The maxima are said to be much higher than those fixed by the German and other continental governments, and the Italian chemists rejoice accordingly. For the work of dispensing (exclusive of drugs or packing) the maximum charges allowed are as follows:

Charge for....	37 oz.	3¾ oz.	2½ drs.
	d.	*d.*	*d.*
Mixing powders and liquids	4	2	1
Cold solution of one or more ingredients	5	3	2
Ditto, hot	7	4	3
Simple emulsion	6	4	3
Oil emulsion	10	5	3
Maceration of one or more ingredients.	6	4	2
Digestion of ditto	10	5	2
Infusion of ditto	6	4	2
Decoction of ditto	8	5	—
Filtration.	2	1	1
Bruising.	8	4	2½
Powders, coarse	8	4	2
" fine	15	5	3
" very fine	25	8	5
Preparation of pastilles	40	10	—
" cold ointments	20	6	3
" hot "	30	8	4
" syrups	20	5	3
" spirituous tinctures	40	20	10
" ethereal "	40	20	10
Distillation of aqueous liquids	14	6	4
" alcoholic "	30	10	7
Preparation from aqueous extracts	—	7	3
" alcoholic "	—	100	60
	100	10	1
	s. d.	*d.*	*d.*
Preparing pills (inclusive of mass)	10	3	1
" " and silvering	1 3	4	1
" suppositories	4 2	10	3

Making plasters—1 square decimetre, on leather, 2*d.*; on silk or linen, 1*d.*; from 1 to 10 square decimetres, on leather, 6½*d.*; on silk or linen, 3¼*d.*; from 10 to 100 square decimetres, on leather, 2*s.* 2*d.*; on silk, 1*s.* 4¼*d.*—Chem. and Drug., 1892, 581.

Prescriptions—The Refilling of.—Editorial, Pharm. Review, 1893, 30.

Who Owns the Prescription? has been answered by a Cincinnati court as follows: "A druggist is under no obligations to furnish a copy, nor to permit any one to make a copy of prescriptions. When he has compounded a drug and delivered it to the proper party, the paper upon which the prescription is written becomes his. Druggists keep prescriptions for their own protection. If, as the plaintiff testified, defendant had agreed to furnish plaintiff with a copy whenever he called for it, that agreement was gratuitous and without consideration, and therefore void."—Meyer Bros'. Drug., 1892, 343.

Uniform Price Scale for Prescriptions.—G. Cutts.—Amer. Drug. and Pharm. Record, 1892, 385.

Prescription Exigencies.—A paper before Amer. Med. Assoc., June 1892; by J. P. Remington.—Pharm. Era, 1893, 196.

Trustworthy Dispensing.—Apoth. Zeit.; Bull. Pharm., 1892, 627.

The Dispensing Counter.—W. Browne.—Pharm. Jour. Trans., 1893, 936.

Prescription Counter.—P. W. Bedford.—Pharm. Record, 1892, 6, 26.

Uniformity in Dispensing.—Editorial, Pharm. Jour. Trans., 1893, 749.

Elegance and Ethics in Practical Pharmacy.—Editorial, Pharm. Jour. Trans., 1893, 975.

Dispensing—Wrinkles in.—J. Pike in Brit. and Col. Drug.; Nat. Drug., 1892, 71.

Hints for the Dispensing Pharmacist—One Thousand.—L. C. Fink in Bull. Pharm., 1892 and 1893. Under the following subjects: Drug Store Nomenclature, Care of Stock to Prevent Deterioration, 293–301; Prescription Department, 448–456, 496–503; Incompatibilities, 545–552; Manufacturing Department, 594–602, 640–649; 5–10; Aphorisms, 11–12.

PHYSICIANS AND PHARMACISTS.

Collaboration in Materia Medica and Pharmacy.—The following suggestions were made by Charles Rice before the American Medical Association for establishing closer and official relations between the two professions of medicine and pharmacy:

1. The American Medical Association, through its proper section (or in any other way that may be determined on) may annually appoint seven (or any other number of) members, who, together with a like number of pharmacists, who may be appointed by the American Pharmaceutical Association, shall constitute the "committee on therapeutics and pharmacy" (or whatever other name may be given to this).

2. This committee shall elect a chairman and vice-chairman, only one of whom shall be chosen from the same profession. These two officers shall also be the chairmen of their respective sections (medical and pharmaceutical) in the committee.

3. The committee may either hold joint sessions at such time as may be agreed upon, or it may transact its business by correspondence.

4. Either section of the committee shall be authorized and instructed to consider any professional questions or problems which may be submitted to it by the other; and, after deliberation, to give such an opinion, or such a decision, as the subject may warrant, from the standpoint of the profession rendering the opinion or decision.

5. The section of the committee making the request or appeal shall bring the reply or decision of the other to the knowledge of the whole of its own profession, or, when this is unnecessary or inadvisable, at least to the notice of those to whom it more particularly applies.

6. The committee, or, if so determined by it, either or both of its sections separately, shall annually report at the joint meeting of the two professions (or say to the section on Materia Medica and Pharmacy of the

American Medical Association) the nature of the questions and problems mutually submitted, if any, and the respective opinions or decisions rendered. These decisions shall be subject to a revision, if one is called for, at this meeting.

7. Each section of the committee shall annually present a report upon professional topics which it may be thought particularly necessary to bring to the attention of the other profession. Thus, the section on Pharmacy may present, for instance, a report on new remedies, accompanied by practical suggestions as to their best mode of administration, as to precautions to be observed in prescribing them, as to incompatibilites to be avoided, and similar topics. And it may submit questions or problems involving therapeutics as it affects pharmacy to the other section, with a view of having them answered or decided. The section on Therapeutics may, in its turn, present problems or questions involving pharmacy as it affects therapeutics to the other section, for solution or answer.—N. Am. Pract., 1892, 309; Pharm. Review, 1892, 176; Pharm. Jour. Trans., 1892, 402.

Regulating the Handwriting of Physicians' Prescriptions.—The Austrian Minister of the Interior has published a decree obliging the municipal magistrates of all the communes to exercise a rigorous surveillance over the legibility of prescriptions written by physicians under their jurisdiction. They are to assure themselves that all are written in a legible manner—clear and distinct—so as to admit no doubt respecting the nature and the dose of the medicaments, or the directions.—Bolletino chim. farm.; Bull. Pharm., 1892, 339.

The Prescribing Druggist.—Editorial, Amer. Drug., 1892, 1, 8.

Chemists as Prescribers.—See Brit. Med. Jour., Oct., 1893. An editorial in Pharm. Jour. Trans., 1892, 351.

Relations of Pharmacy and Medicine.—Editorial in Pharm. Jour. Trans., 1892, 386.

Physician and Druggist.—Jour. Amer. Med. Assoc.; Comments by Pharm. Era, 1893, 98.

Why Physicians Should Specify?—The Times and Reg., 1892, 486; P. C. P., Alumni Rep., 1892, 49.

Attack on Pharmacy—Unwarranted.—Reply to B. Gordon.—Pharm. Record, 1892, 319.

Relations of Physician and Pharmacist.—West. Drug., 1892, 298, 340, 412, 471.

Enforced Temperance for Physicians and Pharmacists.—H. R. Slack.—Pharm. Review, 1892, 189.

Drugs and Druggists.—P. L. Simmonds.—Bull. Pharm., 1892, 513.

The Art of Pharmacy and Vulgar Prejudices against those who Practice it.—From Le Scalpel, through Jour. de Pharm. Elsass-Loth., Nov. 1892. Translation in Pharm. Jour. Trans., 1893, 1046. Also, Nat. Drug., 1893, 175, 195.

Pharmacy as a Liberal and Commercial Profession.—Dupuy.—Midi méd., Toulouse, 1892, 4, 17.

The Pharmacist—His General Relation to Society.—C. H. Scoville.—Pharm. Era, 1893, 536.

Pharmaceutical Responsibility.—Editorial in Pharm. Jour. Trans., 1893, 771.

Belittling the Profession of Pharmacy.—New Idea ; Amer. Drug., 1892, 9.

Illegitimate Pharmacy.—F. Lascar.—Pharm. Record, 1893, 4.

Blackmailing Druggists.—Drug. Circ., 1892, 152.

Insurance Against Blackmail.—Editorial, Amer. Drug., 1893, 145.

Limiting the Number of Drug Stores.—The Royal Academy of Medicine of Belgium is of the opinion that "the limitation of the number of pharmacies constitutes the only efficacious means of obviating existing abuses." French opinion is divided on the subject.—Bull. Pharm., 1892, 520.

The Oldest Prescription in the World.—A. Macalisher.—Brit. and Col. Drug., March 17, 1893.

Illegible Prescriptions.—Illustrated and with interpretations of different pharmacists, in Meyer Bro's. Drug., 1892, 247, 316, 325, 393 ; 1893, 15, 33.—Chem. and Drug., 1892, 723.

——— Illustrated in Pharm. Era, 1893, 58.

——— Illustrated in Chem. and Drug., 1892, 30, 499, 661.

POISONS, LEGISLATION, PROPRIETARIES.

Sale of Poisons to Medical Men and to Each Other.—Our Obligations in the.—M. Carteighe, in Pharm. Jour. Trans., 1892, 381, 390, 439.

Physicians and Patients.—Amer. Lancet ; Drug. Circ., 1893, 44.

Proprietary Medicines—Should they be Prescribed or Recommended by the Physician?—L. Bremer.—Pharm. Review, 1892, 164 and 172 ; read before St. Louis Med. Soc., May, 1892 ; also Phar. Jour. and Trans., 1892, 242 ; Pharm. Rundschau, Sept., 1892 ; Meyer Bros. Drug., 1892, 300.

Patent Medicines—Why I don't Use.—H. H. Burns.—West. Drug., 1893, 230.

How Pharmacists Recommending Medicinal Specifics are Punished in Germany.—Pharm. Zeitschr. ; Bull. Pharm., 1892, 340.

Poisons—Preparation of.—Editorial on the legal points.—Chem. and Drug., 1893, 728.

Poisons—Sale of.—Discussion upon "What uniform method of procedure can be adopted by chemists with regard to the sale of scheduled poisons ?"—Chem. Drug., 1893, 594.

The Sale of Poisonous Proprietary Medicines.—Editorial, Chem. and Drug., 1892, 870.

Handling of Poisons—Rules to be Observed.—L. Buck.—Pharm. Record, 1893, 5.

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What Uniform Procedure can be Adopted by Chemists with Regard to the Sale of Scheduled Poisons ?—F. A. Rogers.—Phar. Jour. Trans., 1893, 897.

Impurities and Mistakes.—T. Lauder Brunton. An address before the Chemists' Assistant's Association.—Phar. Jour. Trans., 1892, 517.

A Pharmacist Sentenced for Manslaughter.—Editorial in Pharm. Review, 1893, 31.

Poisoning—Progress of.—Editorial upon a table of statistics showing the number of accidental poisonings and suicides for the year 1891.—Chem. and Drug., 1893, 133.

An Apothecary Fined for Selling Patent Medicines.—For advertising various patent medicines (among them Warner's Safe Cure) as specifics against numerous diseases, and for selling the medicaments, a Cologne apothecary has been fined 1500 m. ($375).—Chem. and Drug., 1892, 733.

Chemistry and the Administration of Justice.—E. Ludwig.—Pharm. Post, 1892, 1165.

Poison Law.—Editorial, Pharm. Jour. Trans., 1893, 665, 749 and 750.

Relation of the Pharmaceutical Society to the General Body of Chemists.—E. Lemmon.—Phar. Jour. Trans., 1893, 821.

Trade Marks—Important Ruling on.—Oil, Paint and Drug. Rep.; Drug. Circ., 1893, 23.

The Poison Law of Mississippi.—Editorial in Pharm. Jour. Trans., 1893, 555.

The Modern Interpretation of the Pharmacy and Patent Medicine Acts.—Dr. Symes.—Pharm. Jour. Trans., 1892, 397.

Pharmacy Legislation.—W. Bodemann. Suggestions on a revision of the Illinois law.—Pharm. Record, 1893, 42.

Provincial Organization.—Editorial upon Mr. Thompson's timely article on the subject of local organization of members of the Pharmaceutical Society.—Pharm. Jour. Trans., 1892, 385.

Pharmaceutical Laws.—Date of their enactment.—Pharm. Record, 1893, 214.

American Pharmacy Law.—A few items from the work on "The Law and Medical Men," by R. V. Rogers.—Chem. and Drug., 1893, 118.

Dispensed Medicines.—Editorial, Chem. and Drug., 1893, 484.

Advertisements as Legal Documents.—Editorial on the suit against Carbolic Smoke Ball Co.—Chem. and Drug., 1892, 48 (ibid., 39).

How Australian Traffic Effect Chemists.—Editorial, Chem. and Drug., 1892, 706.

Pharmacy and Medicine Acts—Modern Interpretation of.—Dr. Symes.—Chem. and Drug., 1892, 675.

Pharmacy and Poison Laws.—Editorial in Chem. Drug., 1892, 646.

Pharmacy Laws—The Object of—and Benefits to be Derived therefrom.—Editorial, Pharm. Era, 1893, 146.

Pharmacy Boards' Certificates—Is Reciprocity Desirable?—E. Fowler.—Amer. Drug., 1893, 308.

Board of Pharmacy—Work of.—Cyrus Edson.—Drug. Circ., 1893, 123.

Why I Oppose Pharmacy Laws.—J. R. Perry.—Amer. Drug., 1893, 148.

Are Pharmacy Laws Oppressive and Injurious, or the Contrary?—A symposium of the readers of the Nat. Drug., in Nat. Drug., 1893, 173, 209.

Should Graduates in Pharmacy be Registered without Examination?—R. J. Parker.—Drug. Circ., 1892, 150.

Michigan Pharmacy Law—H. S. P. Whitmarsh.—Pharm. Era, 1893, 437.

The Registered Pharmacist.—Bull. Pharm., 1892, 571.

Pharmacy Legislation.—Editorial, West. Drug., 1893, 172.

Patent Medicine Legislation.—West. Drug., 1893, 128.

Proprietary Medicines Containing Poisons—Restricting the Sale of.—Editorial, Chem. and Drug., 1892, 548; 1893, 242, 276, 287, 308, etc.

Proprietary Medicines Containing Poisons.—Editorial, Pharm. Jour. Trans., 1892, 409, 431.

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———Hygiene, London, 1892, v; 23, 115, 174, 225.

Can the Cutter be Annihilated?—L. Schulze.—Pharm. Review, 1892, 225.

The Cutter—Two Methods of Treating.—Editorial, Nat. Drug., 1892, 177.

The Professor and the Cutter.—W. C. Alpers.—Drug. Cir., 1893, 4, 42.

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Recent Patents and Trade Marks.—See Amer. Drug., Pharm. Era. Drug. Cir., 1892, 1893.

Proprietary and Pharmaceutical Preparations—Comparative Value of.—Harry Wise.—Read before Tri-State Med. Soc. of Tenn., Ga. and Ala.—Drug. Cir., 1892, 267.

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Wholesale Merchant.—R. A. Parker.—Meyer Bros. Drug., 1892, 238.

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Proprietary Medicines and State Supervision.—Editorial, Amer. Drug., 1893, 166.

Freezable Goods.—List of goods liable to freeze, in Nat. Drug., 1892, 141; Meyer Bros'. Drug., 1893, 19.

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Duties of Employers to Employees.—Editorial, Amer. Drug., 1893, 191.

The Drug Clerk's Duty.—J. Anderson.—Meyer Bros.' Drug., 1892, 406.

Clerk—A Chat with.—Pharm. Era, 1893, 241.

Pharmaceutical Apprenticeship.—R. H. Mitchell.—Pharm. Jour. Trans., 1892, 477.

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Shop Hours.—Editorial, Chem. and Drug., 1892, 80, 401.

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To Students.—Some words of advice by E. L. Marks.—Pharm. Jour. (Aus.), 1893, 71 and 101.

Conditions of Labor in Pharmacy.—Discussion by Chemists' Assistants' Association.—Chem. and Drug., 1892, 670, 756, 783, 816.

Women in Pharmacy.—The views of different writers upon this subject in Meyer Bros. Drug., 1892, 237, 290, 331, 368, 387; 1893, 16, 38, 93, 121.

Woman Druggist.—Pharm. Era, 1893, 53.

Lady Pharmacists.—Views of the position and prospects of women in pharmacy, by some of them. Chem. and Drug., 1892, 143–146.

Women in Pharmacy.—Editorial upon G. Kaunitz's views permitting women in pharmacy.—Zeits. Oest. Apoth. Ver., 1893, 116.

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——— Ibid., 315.

Assistants and Women in Pharmacy.—The Question of.—Zeits. Oest. Apoth. Ver., 1893, 166.

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Dispensaries—The Abuse of.—From "Private Relief of the Poor," by Herbert Spencer.—Pop. Sci. Monthly, July, 1892; Amer. Drug. and Pharm. Record, 1892, 39.

——— *New York City's.*—Amer. Drug. and Pharm. Record, 1893, 350.

——— *Free.*—Editorial, Pharm. Record, 1892, 281.

Free Dispensary Question.—Interesting and logical remarks from a historical standpoint, in N. Y. Sun.—West. Drug., 1892, 403.

A Fund for the Sick.—J. B. Nagelvoort offers some rules and regulations under which a fund for the sick will prosper, be a benefit to our less wealthy citizens, and a source of honest income to druggists and physicians. —Bull. Pharm., 1892, 318.

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Advertising—Cardinal Points in.—West. Drug., 1893, 82.

——— *Does it Pay a Druggist?*—S. Palmer.—West. Drug., 1892, 376.

——— *Effective.*—Pharm. Era, 1893, 34.

——— *Tips on.*—Illustrated articles in Amer. Drug., 1892, 84, 104; 1893, 125, 146, 168, 209, 342, 408.

Retail Druggists' Receipts—One Way of Increasing.—Editorial in Bull. Pharm., 1892, 495.

Drug Trade—The Business Side of.—H. P. Campbell.—Pharm. Record; Nat. Drug., 1892, 168.

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Hints and Practical Suggestions.—C. H. Davis.—Pharm. Record, 1892, 405.

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the hands of druggists.—Pharm. Era, 1892, 298; from Chem. and Drug. Also Pharm. Era, 1892, 326.

Show Windows—The Arrangement of.—J. Hurley.—Pharm. Record, 1893, 189, 231; Pharm. Era, 1893, 342.

Window Displays—Hints About.—Drug. Circ., 1893, 99.

Window Dressing.—Pharm. Era, 1892, 160, 224.

——— Chem. and Drug., 1892, 56, 154.

Chemists' Christmas Displays.—Illustrated article on window dressing. —Chem. and Drug., 1892, 872.

Drug Trade—The Future of the.—Editorial, Chem. and Drug., 1893, 377.

Signs—Origin of.—J. J. Winkelmann.—Meyer Bros.' Drug., 1893, 127.

What we Cannot Take Back.—W. Bodemann, on goods bought and returned.—Amer. Drug., 1893, 129 and 359.

Contrasts of Colors.—In "A Short Manual of Window Dressing," issued by the Norwich Nickel and Brass Works, occur some hints in regard to the disposition of color in show windows. Republished in Drug. Circ.; Meyer Bros.' Drug., 1892, 261.

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Official and Officinal.—Notes by Chas. Rice, J. P. Remington, R. G. Eccles, O. Oldberg, W. Simon and S. Waggaman.—Pharm. Record, 1892, 442.

Moise Charas—Pharmacy in his Day, and the Spanish Inquisition of 1688.—Translation in Nat. Drug., 1892, 105, 126, 148; from Jour. d'Uzes.

Carl Wilhelm Scheele.—A brief account of his life and work.—Pharm. Jour. Trans., 1893, 568.—C. S. Hallberg, West. Drug., 1893, 6.

History of Remedies—Curiosities of.—H. Conlon. Review of a book of 150 pages, octavo, published by Regnier frères, Cambrai, in Jour. de Med.; Nat. Drug., 1892, 115.

An Ancient MS. Recipe Book.—J. C. Shenstone. A book of recipes in use in the eighteenth century.—Pharm. Jour. Trans., 1892, 387.

Shroder's Chemical Dispensatory.—Extracts from in Pharm. Era, 1892, 324.

Ancient Pharmacy.—B. W. Petsche.—Pharm. Era, 1893, 485.

Healing Art Among the Early Greeks.—P. C. Remondino in Nat. Pop. Rev.; West. Drug., 1893, 15.

Odd Orders—List of.—Meyer Bros.' Drug., 1892, 247, 289, 325; 1893, 23, 49, 115. Also Chem. and Drug., 1892 and 1893.

Collection of Queer Orders. E. G. Boyson.—Pharm. Era, 1892, 144, 272; 1893, 160, 208, 297, 352, 400, 560.

Synonyms as they appear daily in Drug Stores.—Pharm. Post, 1892, 938, 1222.

Springs—The Origin of.—M. Nicaise in Rev. Scient.; Nat. Drug., 1892, 151.

Pharmaceutical Philanthropist.—Aus. Jour. of Pharm.; Pharm. Review, 1893, 15.

Cements.

Mucilages, Pastes and Cements—Formulas for.—Pharm. Era, 1892, 138.

Diamond Cement.—500.0 parts of finest glue are allowed to soften and swell for several hours in 400.0 water and 100.0 acetic acid (96 per cent.); it is then warmed until dissolved and 1.0 pure carbolic acid added.—Amer. Jour. Pharm., 1892, 409.

Cement for Porcelain.—20.0 parts of white lead and 12.0 parts of pipe clay, carefully dried, are incorporated with 10.0 boiled linseed oil heated on a water-bath; the cemented articles are dried slowly in a warm place. —(Industrie-Bl.) Pharm. Centrathalle, 1892, 330.

Syndetikon.—In 400.0 parts of the sugar-lime solution (see below) 600.0 parts of ground glue are allowed to soften for three hours; after heating to effect solution and replacing the evaporated waste, the cement is neutralized with oxalic acid (about 30.0) and 1.0 carbolic acid added.—E. Dieterich, Pharm. Ztg., 1892, 154.

Universal Cement.—250.0 parts of sugar placed in a flask are dissolved in 750.0 water by aid of a water-bath, 650.0 slaked lime added, and the mixture warmed for three days at 70–75° C., agitating repeatedly. After cooling, the supernatant liquid is poured off clear; 200.0 are diluted with 200.0 water and 550.0 finest glue allowed to swell in it for three hours, when it is heated until perfect solution takes place; after restoring the original weight by adding water, 50.0 acetic acid (96 per cent.) and 1.0 pure carbolic acid finish the preparation.—Amer. Jour. Pharm., 1892, 409.

Marine Glue, according to Moniteur Industriel (Nouv. Reméd., April 8, 1892, iv.), is prepared as follows: About 450 Gm. of caoutchouc are dissolved in 18 litres of benzol. When solution has taken place, and the mixture assumed the consistency of a thick cream, which it usually does after about 10 days, shellac is added equal to two or three times the weight of the solution. The mixture is heated and run into plates. The glue is used at a temperature of 120° C.—Ibid., 407.

Paste for Fixing Labels on Glass, Porcelain, and Iron.—The following is recommended in Nouveaux Remédes, November, 1892, p. 1: 120 Gm.

of gum arabic and 30 Gm. of gum tragacanth are macerated separately in a little water; the latter mixture is agitated until a viscous emulsion is formed, when the gum arabic solution is added, and the whole filtered through fine linen. With this liquid are then incorporated 120 Gm. of glycerin, in which 2.5 Gm. oil of thyme have been dissolved. The volume is then made up to one litre by the addition of distilled water. This paste is said to possess remarkable adhesiveness, and to keep well in sealed flasks.—Ibid., 407.

Paste for Attaching Paper to Glass.—Pharm. Record, 1893, 101.

——— *New Label.*—Rund. (Prag.); Pharm. Era, 1893, 265. Wet 175 parts of white dextrin with an equal amount of warm water, then add 250 parts of boiling water, and boil the whole for five minutes. Remove, let cool, and add 30 parts of dilute acetic acid, 30 parts glycerin, and 10 drops of clove oil to each pound of the mixture.

Chamois—To Clean.—In a suitable vessel place a weak solution of sodium hydrate, and add to this some rasped soap, or soap solution. Throw the chamois into this, let it soak for two or three hours, and then rub it clean. Rinse in clean, tepid suds, wring out, and wrap in a cloth and dry quickly. When dry, rub together or brush with a stiff brush to restore softness. A chamois skin thus treated will for all practical purposes be as good as new.—Nat. Drug., 1892, 85.

Colognes and Toilet Waters.—Pharm. Record, 1892, 425.

Cheap Perfumes and Sachet Powders—Formulas for.—Amer. Drug. and Pharm. Record, 1893, 404.

Perfumes and Pomades—Formulas for.—Pharm. Post, 1893, 79.

Colors—The Names of New.—Meyer Bros.' Drug., 1893, 83; from Can. Drug. "Angelique" is a pale apple green; "Beige," really a beige drab; "Caster," a dark beige; "Castile," a bright buff yellow; "Coquelicot," is a bright brick red; "Diavolo," a bright cinnamon; "Emeralde," a brilliant emerald green; "Floxine," a brilliant light crimson; "Geranium," a pale geranium red; "Mascot," a medium moss green; "Murier," an indefinite moss green; "Paradis," a bird of paradise yellow; "Bivoine," a deep metallic scarlet; "Vareche," a dark moss green.

Domestic Dyes—Formulas of.—A. Thurston.—Amer. Drug., 1893, 195.

Household Dyeing—Collection of Formulæ.—Pharm. Era, 1893, 347.

Colored Fires.—E. J. Kennedy gives the history, composition, chemistry and formulas for colored fires.—West. Drug., 1893, 54.

Fly Papers—Formulas for.—Amer. Drug., 1893, 338.

——— Saccharin fly paper is prepared by saturating bibulous paper with a solution of saccharin in water containing honey. Saccharin is claimed to be a deadly poison to them, and, at the same time, is eaten with avidity.—Pharm. Centralh., 1892, 545.

Formulæ from the Pharmacopœia of the Edinburgh Royal Infirmary.—Chas. Arthur.—Pharm. Record, 1893, 60, 119.

Glass.

Glass—Graphical Chemistry of.—E. Nickel.—Abstract, Jour. Chem. Soc., 1892, 1158.

Glass Suited for Chemical Apparatus.—Weber and Sauer. Flasks constructed of glasses of different composition were tested by boiling in them water, 25 per cent. H_2SO_4, 12 per cent. HCl, 10 per cent. ammonia, 2 per cent. Na_2HPO_4, and 2 per cent, Na_2CO_3, and then determining the amount of loss sustained. The water was caused to act for five hours, the other reagents for three hours each. The glass least affected by the reagents had the composition $6SiO_2$: 1CaO: 1.3–15 alkali. It is preferable to have Na_2O predominate over the K_2O.—Ber. d. Chem. Ges., xxv., 70.

Amber Glass.—The failure of amber glass to completely exclude the actinic rays of light has been demonstrated by Biltz (Pharm. Ztg.). As a test he placed alcohol-free chloroform in a thin, light-amber bottle and also in a thick, dark-amber bottle, and exposed both to daylight. In spite of cold weather the chloroform in the thin-walled bottle gave evidence of decomposition in two months, and that in the thick-walled bottle in three and one-half months. Another test was made with silver chloride paper. When placed in dark-amber, thick-walled, glass vessels it soon became colored, whereas when placed in ordinary glass vessels covered with black paint or enclosed in pasteboard the paper remained unaltered. The inference to be drawn is that "to be protected from light" should signify either preservation in a dark place or in vessels entirely impervious to light.

American Glass.—Statistics.—Pharm. Era, 1893, 417.

An Alloy which Adheres to Glass.—F. Walter has found that an alloy consisting of 95 parts of tin and 5 parts of copper adheres so tenaciously to glass that it may be employed as a solder to join the ends of glass tubes. —Rev. Scient; B. and C. Drug., Aug. 1802; Pharm. Jour. (Aus.), 1892, 341.

To Fasten Glass Letters, Figures, etc., on Glass (show windows) so that even when submerged in water for several days they will not become detached, use an india-rubber cement. The best for this purpose consists of 1 part india-rubber, 3 parts of mastic, and 50 parts of chloroform. Let stand for several days at a low temperature to dissolve the cement. It must be applied very rapidly, as it becomes thick very soon.—Scientific American; Bull. Pharm., 1892, 577.

Reagent Bottles—Keeping Clean.—The unsightly appearance of reagent bottles caused by the drops of the solutions running down the outside may be prevented by simply painting the rim with melted paraffin. Care

should be taken to cover only the side of the lip—none should be put on the upper surface. This can be accomplished by using a *small* hog-hair brush and a wax of low melting-point, such as is used for imbedding microscopical sections. It enables one to deliver the reagent easily in single drops, without resorting to the plan of only partly withdrawing the stopper. —Bull. Pharm., 1892, 473.

Labeling Chemical Glassware.—H. C. Bolton, in Journ. Anal. and App. Chem., recommends the use of colored pencils, especially made and prepared by A. W. Faber, for writing on glass, metal and porcelain. The small amount of grease in the crayon causes the marks to adhere to the smooth surface of the glass, and grinding is therefore unnecessary.—Pharm. Rev., 1892, 154.

——— The Pharm. Post recommends for this purpose, instead of the diamond points usually employed, which are apt to cut too deeply, the Arkansas oil stone (Mississippi stone), sold in tool stores. With a piece of this about 4 cm. long by 5 mm. thick the characters should be traced slowly and with firm pressure.—Drug. Circ., 1893, 132.

Inks.

Inks.—E. Dieterich.—A collection of formulæ from the author's manual. —Pharm. Rund., 1892, 215 and 240.

——— *Anilin.*—From textile-chemical standpoint.—A. Ganswindt.—Pharm. Centralh., 1893, 245–250.

——— *The Making of.*—Drug. Circ., 1892, 244.

Indelible Ink.—Gay uses the official solution of perchloride of iron. The writing traced by this liquid, not very deeply colored at first, becomes deeper and deeper with each washing until it reaches the characteristic deep brown of iron stains, and at this it remains indefinitely.—Nat. Drug., 1893, 4.

Ink.—W. I. Clark. An attempt to place the manufacture of ink upon a scientific basis.—Chem. and Drug., 1892, 151.

Leather and Leather Articles.—Formulas relating to the manufacture and use of.—Pharm. Era, 1892, 331.

Liqueurs—Some Famous.—An account of the following: Benedictine, Chartreuse, Maraschino, Noyeau, Kirsch.—Amer. Drug. and Pharm. Record, 1893, 388.

Ozonine.—Ozonine, a new bleaching agent, is obtained in the following manner: 125 parts of resin are dissolved in 200 parts oil of turpentine, and to this is added a solution of 25 parts of potassium hydrate in 40 parts of water and 90 parts of solution of hydrogen of peroxide. This forms a

jelly, which becomes changed on standing and exposure to light into a clear fluid. A few drops of the fluid added to water exert a bleaching effect upon cloth and other fibres, which is said to be identical in acid and alkaline solutions.—Pharm. Record, 1892, 58.

Effervescent Pastilles—Formulas of.—Pharm. Record, 1892, 303.

Rubber Stamps—Pads for.—Dietrich gives the following in his *Manual:* Boil 35 parts of Japanese (tien-tian) gelatin in 3,000 parts of water until completely dissolved. Strain while boiling hot through flannel, add 600 parts glycerin, return to the fire, and evaporate down to 1,000 parts. With this liquid as a basis, make the ink of the color desired, using 60 parts of methyl violet (3B) for violet, 80 parts eosin (BBN) for red, 80 parts of phenol blue for blue, 50 parts anilin green for green, and 100 parts of nigrosin for black. With this ink saturate the cushion of the pad-box, and cover with mull. If at any time the surface becomes too dry, moisten with water or glycerin.—Nat. Drug., 1892, 161.

Sealing Waxes.—Formulas for.—Pharm. Record, 1892, 106.

Shampoo Liquids.—Formula for.—Ibid., 272.

Shoe Blacking.—Collection of Formulæ in Pharm. Era, 1892, 106.

Show Bottles.—Colors for.—Pharm Record, 1892, 180.

Sponge Cleaning.—J. W. England in Am. Jour. Pharm., 1893, 6. After beating to separate mineral impurities as much as possible, macerate in diluted hydrochloric acid to dissolve lime salts, wash in cold water, knead thoroughly by hand with green soap in hot water, rinse, immerse in a 1 : 20 carbolic acid solution, and keep for use. This is the plan followed by Dr. Gersten, who says, in his well-known Surgery, that: "Sponges once used in an aseptic operation can be used again. Careful washing out with green soap and hot water to remove fibrin and blood, and then immersion in a 1 : 20 carbolic acid solution, is all-sufficient."

Whitewash—Waterproof.—Mix 3 parts of pulverized silicious rock (quartz), 3 parts coarsely-powdered marble, or 3 parts coarsely-powdered sandstone, 2 parts burned kaolin, or fire-clay, and 2 parts of freshly-burned lime, still warm. Repeated wettings of this mixture form a silicate which becomes, if allowed to dry and solidify, like a stone. The four constituents mixed together give the ground color, to which any pigment (that can be used with lime) is added. It is applied quite thickly to the wall, or other surface, let dry one day and the next day frequently covered with water,

which makes it water-proof. This wash can be cleansed with water without losing any of its properties; on the contrary, each time it gets harder, so that it can even be brushed, while its porosity makes it look soft. The wash, or calcimine, can be used for ordinary purposes as well as for the finest painting. A so-called fresco surface can be prepared with it in the dry way.—West. Drug., 1892, 422.

Woodwork—Preservative against Humidity for Use on.—Jordon in Cosmos.—Nat. Drug., 1892, 161.

Wooden Vats, Tubs, etc.—Application for.—La Nature says that the following process will not only prevent wooden tubs, troughs, etc., for laboratory and industrial uses, from leaking, but makes them proof against concentrated acids and alkalies: Melt together equal parts of paraffin and gutta-percha, and while hot apply with metallic brushes to the surface to be protected. After the substance is applied, go over the surface with a hot iron. This drives the material deeper into the wood, and at the same time polishes the surface.

Fire-Extinguishing Liquid—New.—The following has been patented in France and other Continental countries: Make the following solutions: 1. Ammonium chloride, 200 parts; water, 20,000 parts. 2. Alum, calcined and pulverized, 350 parts; water, 10,000 parts. 3. Ammonium sulphate, in powder, 3,000 parts; water, 5,000 parts. 4. Sodium chloride, 2,000 parts; water, 40,000 parts. 5. Sodium carbonate, 350 parts; water, 5,000 parts. 6. Liquid water glass, 4.500 parts. Mix the solutions in the order named, and to the mixture add 20,000 parts of water.—Nat. Drug., 1892, 161.

SODA WATER.

The Apothecary as a Soda Water Dealer.—Pharm. Post, 1893, 143.

A New Soda Water Process.—Chem. and Drug., Nov. 12, 1892. A Berlin firm has applied for a patent for an invention by which the carbonic acid gas is transferred, out of a metal container in which it is kept under high pressure, directly into the glass bottle which has first been filled with water, thus avoiding the use of all complicated machinery. It is possible—so the account runs—to fill 150 bottles per hour at a total cost of about 4d.

Making Soda Water.—Thos. Warwick.—Bull. Pharm., 1893, 12.

The Generator—How to Charge.—Thos. Warwick.—Ibid., 57; (also West. Drug., 1893, 181.)

Fountain Linings—The Collapse of.—Thos. Warwick. Ibid., 103.

Dispensing Apparatus—The Silver Work of.—Thos. Warwick.—Ibid., 198.

The Syrup Tanks.—Thos. Warwick.—Ibid., 1892, 506.

The Draught-Arms—Coolers and Cooling.—Thos. Warwick.—Ibid.

Hot Soda Water.—Thos. Warwick.—Ibid., 552.

Hot Soda Water—Dispensing.—Thos. Warwick.—Ibid., 649.

Hot Soda Water Boilers.—Thos. Warwick.—Ibid., 604.

Hot Soda.—E. C. Marshall.—Amer. Drug., 1892, 86; Thos. Warwick, ibid., 87; L. F. Stevens, ibid., 108.

Soda Water—Troubles in Dispensing.—Thos. Warwick.—Amer. Drug., 1893, 149.

Soda Water—Dispensing.—Thos. Warwick.—Amer. Drug., 1893, 174.

Soda Dispenser—Notes for the.—F. B. Hays.—Drug. Circ., 1893, 99.

Soda Water Syrups.—Formulas for, in West. Drug., 1893, 228.

Creosote Syrup for the Soda Fountain.—

Creosote	1 part.
Cognac brandy	50 parts.
Simple syrup	300 parts.
Tincture of peppermint	2 parts.

—Zeits. Oesterr. Apoth. Ver.; Nat. Drug., 1892, 3.

Foams—Soda Water.—Thos. Warwick.—Confect. Jour.; Nat. Drug., 152.

Flavoring Extracts.—Approved working Formulæ.—Confect. Union.; Nat. Drug., 1892, 214; 1893, 34, 45, 72.

——— *Formulas for.*—Pharm. Era, 1892, 76.

Fruit Juices.—Pharm. Era, 1892, 72.

Fruit Syrups—Tests for.—Nat. Drug., 1893, 28; from Confect. Union.

Hot Soda Water Syrups—Formulas for.—Pharm. Record, 1892, 327.

Root Beer—Formulas for.—Drug. Circ., 1892, 177.

ADULTERATIONS.

Adulterations.—Report of the committee on adulterations of the Illinois State Pharmaceutical Association upon the examination of gum arabic, dextrin, asafetida, myrrh, gamboge, aloes, spirit of nitrous ether, hydrochloric, nitric and sulphuric acids, Blaud's Pills and rock candy syrups.—West. Drug., 1892, 254.

Detection of Rye Flour in Wheat Flour.—A. Kleeberg reported, in a two-column article in Chemiker Zeitung, No. 60, 1892, an observation of his (for which he claims priority rights) in the discovery of rye flour in wheat flour, shown by the slimy, somewhat sticky behavior of the rye flour. Prof. D. Hanausek immediately sent in his objection to the claim of A. Kleeberg, and called attention to an item in his book "Die Nahrungs- und

Genussmittel a. d. Pflanzenreiche" (Cassell, 1884), in which that peculiar behavior is described.—Bull. Pharm., 1892, 512.

Spices.—Chemical and microscopical examination of the common spices. —J. Holfert in Pharm. Rundschau, 1892, 272; from Schweiz. Wochenschr. f. Pharm., 1892, 409, and Pharm. Zeit., 1892, 650.

——— T. F. Hanausek.—Chem. Zeit., 1892, 1494–1498; 1893, 652, 813, 864, 916. (See also Zeits. Oest. Apoth. Ver., 1892, 773, 822; 1893, 50, 75.)

Food Adulteration and the Use of Artificial Preservative Agents.—Philada. Med. World; Drug. Circ., 1893, 66.

Adulteration—Battle Against.—Editorial, Chem. and Drug., 1892, 679.

——— *The Antiquity of.*—J. C. McWalter.—Pharm. Review, 1892, 156; from Oil Paint and Drug. Rep.

Glass Wool containing Lead.—L. Blum examined a glass-wool and found it to contain lead.—Zeitsch. f. Anal. Chem., xxxi.; Chem. News, 1892, 53.

RUBBER GOODS.

Injurious Constituents of Rubber Articles with which Children of Different Ages come in Contact.—A. Bulowsky disagrees with C. Ewald, who has maintained that vulcanized rubber nipples can injuriously affect infants by causing diarrhœas through formation of sulphuretted hydrogen gas, and shows that no such formation occurs. Bulowsky's conclusions are that:

1. Rubber articles are harmless when they float, are elastic and are of soft consistence.

2. The greater the specific gravity, the greater the ash and the less the value.

3. Black nipples and rings are harmless.

4. Black dolls which sink are dangerous on account of lead.

5. Red and red-brown dolls and toys are harmless.

6. All gray rubber articles, especially those which children put into their mouths to suck, are more or less harmful on account of the contained oxide of zinc.—Arch. f. Hygiene, 15, 125; Amer. Jour. Med. Sci., 1893, 230.

Vulcanized Goods—How to Estimate the Quality of.—The Russian government last year appointed a commission to determine rules for the estimation of the quality of vulcanized rubber goods furnished for army and navy use. M. Viadimroff was chief of this commission, and he recently reported a set of rules, determined from experiment, of which the following is a summary: 1. Caoutchouc should not show the least sign of break when bent at an angle of 180° (*i. e.*, doubled upon itself), after an exposure of five hours in an air-bath of 125° C. (257° F.) 2. Caoutchouc containing not over 50 per cent. of metallic oxides should bear stretching to five times its length before rupture. 3. Caoutchouc exempt from all

foreign matter except sulphur should be capable of stretching seven times its length before rupture. 4. The extension of such caoutchouc, examined immediately after stretching, should not exceed 12 per cent. of its original length. 5. Suppleness may be calculated by the percentage of ash after incineration; the greater the amount of ash the less suppleness. 6. Vulcanized caoutchouc should not harden in the cold.—West. Drug., 1892, 169.

Rubber Goods.—Analysis by H. J. Phillips of an india-rubber mat.—Chem. News, 1892, 109. The author found 54.26 per cent. caoutchouc.

——— Estimation of caoutchouc.—Ibid., 120.

——— *Chemical Analysis of.*—R. Henriques, in Chem. Zeit., 1892, 1644; 1893, 634, 707.

——— ——— D. Holde (Mitt. könig. tech. Versuchs., 1892, x., 315, through the Analyst,) supplements the work of Henriques by the suggestion of a method for the determination of the oil in rubber and its substitutes other than that which has been "vulcanized" by treatment with sulphur chloride. The unaltered oil is soluble in ether-alcohol, whereas rubber and its substitutes are not much attacked by this solvent. It is true that pure caoutchouc yields three to four per cent. of an oily substance when extracted with ether-alcohol, and a correction is therefore necessary. The mixture adopted consists of four parts of ether and three of alcohol, and is best used by allowing the rubber to stand in the ether for a day and become swollen to a pulp, the mass being heated, if necessary, and then adding the alcohol. After the removal of the fatty oil the analysis can be proceeded with in the manner indicated by Henriques.—Amer. Drug. and Pharm. Record, 1893, 386.

Caoutchouc and Gutta Percha.—C. Heinzerling. Chemical examination and consideration of some of the innovations in their manufacture.—Chem. Zeit., 1892, 1557. Also Pharm. Centralh., 1892, 734.

Rubber Goods—Deterioration of Druggists'.—J. A. Sherman mentions a few of the causes which go to spoil this class of stock, and criticises the means which are taken to prevent deterioration. Fine surface-cracks are taken as evidence that the goods are going wrong, and this may be due to (1) being kept in warm, dry air, as on top shelves in the shop; or (2) exposure to sunlight—thus all goods shown in the window rapidly become bad. These are really the chief sources of trouble. On the whole, proper vulcanization is the only security that india-rubber goods will keep well, and, as long as they are stored in a part of the shop where the temperature is equable and moderate, the most is done, that can be, to prevent deterioration.—India Rubber World; Bull. Pharm., 1892, 576.

The Smell of Rubber Goods may be removed, it is said, by dipping them into a one per cent. alcoholic solution of salicylic acid.—Nat. Drug., 1893, 76.

Gutta Percha—New Method for Producing.—Jungfleisch (in Jour.

Pharm. Chim., 1892, 227; through Pharm. Post, 1892, 1261) has made researches on the extraction of rubber which promise to be of great practical bearing on the industrial production of gutta percha.

The best Malayan plant for the production of rubber is the Isonandra Gutta (Hooker). The Malayans cut down trees aged 28 to 30 years, from which the yield amounts to about 265 grams of impure gutta percha per tree. According to the exports from the Malayan harbors in 1884, the number of trees destroyed must have been at least 12,000,000 for that year alone. An exhaustion of the source of supply is, therefore, threatened if the old method of production were adhered to. Professor Jungfleisch's researches indicate that the trunk of the tree contains the least of the rubber-producing constituent, and that the leaves, contrary to the general opinion, contain a constant and considerable supply of gutta percha.

The pulverized leaves are exhausted with toluol at 100°, and then the solution evaporated on a water-bath. The yield by this method amounted to between 9 and 10.5 per cent. The product was of a greenish hue on account of the presence of chlorophyll. The method is also applicable in the purification of crude gutta percha. While a 30-year-old tree yields only about 265 grams of gutta percha, 25 to 30 kilograms of its fresh leaves will give from 1,000 to 1,100 grams without affecting the future annual production. Efforts are being made to apply the method to the industrial extraction of gutta percha.

——— *Constituents of.*—1. *Gutta*, a white, amorphous hydrocarbon $(C_{10}H_{16})_n$, melting at 53° C., soluble in chloroform, carbon disulphide, fixed and volatile oils and in hydrocarbons, altered by light and air, forming a yellow, friable mass, partly soluble in alkalies and alcohol and incompletely soluble in the first mentioned solvents. 2. *Alban*, $C_{40}H_{64}O_2$, melts at 195° C., soluble in hot alcohol (upon cooling separates in small, lustrous scales) and the usual solvents, but insoluble in water and alkalies; heating with alcoholic potassic hydrate solution yields a hydrocarbon, *albene*. 3. *Fluavil*, friable, yellow, amorphous $(C_{10}H_{16}O)_n$, melts at 82–85° C.; has the same solubilities as alban. 4. *Guttan*, an unstable compound, in many respects resembling gutta. These constituents obtained from an authentic sample of gutta-percha from Payena Lecrii are identical with those obtained from the commercial article. Of the constituents *gutta* is the one showing the characteristic plasticity of gutta-percha, while the presence of any considerable quantity of fluavil makes it brittle. All of these substances are indifferent to the ordinary chemical reagents; but the alteration of the gutta and guttan by exposure to light and air, also to electrical influences, causes a deterioration of the gutta-percha, although it is not possible to say at present if these decomposition products are related to fluavil and alban.—Otto Oesterle, Arch. der Pharm., 1892, 641; Am. Jour. Pharm., 1893, 136.

Caoutchouc—Synthesis of.—By Tilden. Isoprene made from turpentine

was found on age to be entirely changed in appearance, the limpid, colorless liquid having changed to a dense one in which floated several large masses of a yellowish solid, which proved to be india-rubber, the characters of which appear to agree remarkably with those of Para rubber.—Chem. News, lxv, 1697, 265; Pharm. Jour. and Trans., 1892, 2.

Artificial India Rubber.—Factory in Savannah.—Chem. and Drug.; Amer. Drug. and Pharm. Record, 1893, 40.

Para India-rubber.—Pharm. Jour. Trans., 1893, 789; Consular Rep., 1892, 1136.

India-rubber—Production of.—An account of the production of India rubber in Nicaragua. The best rubber, known as *borricha*, is taken from long channels, and contains less water than other kinds.—Jour. Soc. Arts., xl, 896; Pharm. Jour. and Trans., 1892, 263.

——— Pharm. Centralh., 1893, 80; from Ind. Blätter.

MEDICAL, PHARMACEUTICAL.

Chemical Constitution and Therapeutic Action.—H. Thoms, in Pharm. Centralh., 1893, 145.

Valence of Elements and their Physiological Action—The Relation between.—A. Miolati.—Schweiz. Wochenschr. f. Ch. u. Pharm.; Pharm. Review, 1892, 216.

Hypnotic Action and Chemical Constitution of Organic Substances.—Schneegans and Mering.—Pharm. Centralh., 1892, 462.

Chemical Substances—Physiological Action of.—Eichengrün expresses the opinion that, in the present state of science, there is no foundation for the hypothesis of a relation between chemical constitution and physiological action.—Pharm. Jour. Trans., 1893, 1.

Columbus and Medicine.—Amer. Drug., 1893, 334; from Chem. and Drug., 1893, 625.

Pharmakotherapy of our Time.—J. Weiss, in Pharm. Zeit., 1892, 343; Pharm. Rund., 1892, 265.

Pharmacology—Its History.—G. Pouchet.—Rev. Scient., Paris, 1892, xlix, 641.

Aromatic Compounds—Action of Carboxyl Group upon the Increased Action of.—Nencki and Bautmy.—Pharm. Centralh., 1892, 439.

Sentence of Death—Expert and Medical Opinion upon the.—T. Deecke.—Pharm. Rund., 1893, 127.

Administering Toxic Medicaments—A New, Safe Method of.—E. Trouette, in a paper read before the Paris Academy of Medicine, and published in the Rev. de Ther., entitled "Duodecimal Doses of Toxic Medicaments," proposes a method of obviating the difficulties hitherto preventing the general use of many valuable medicinal principles. The

plan he proposes is a new method of posology, based on the rational division into twelve parts of the maximum dose which may be given to an adult in twenty-four hours. The advantages claimed for this method are, first, accidental poisoning need no longer be feared. Second, dangerous medicaments may from the outset be given in efficient dose without the least risk.—Drug. Circ., 1892, 190.

Aleuronat.—Ebstein recommends this plant albumen compound in the food of diabetics.—Pharm. Centralh., 1892, 398; from Wiener Med. Bl., 1892, No. 19 and 20. (Also Rep. de Pharm., 1893, 208.)

Anæsthetic—A Local.—Parsons recommends the following formula: Chloroform, 12; tincture of aconite, 12; tincture of capsicum, 4; tincture of pyrethrum, 2; oil of cloves, 2; camphor, 2. The camphor is first dissolved in the chloroform, and the oil of cloves and the tinctures are then added.—L'Union Pharm., 1892, 549; Am. Jour. Pharm., 1893, 129.

Amulets—Electropathic.—Editorial, Brit. Med. Jour.; Drug. Circ., 1892, 232.

Armenian Paper.—A fumigating paper made as follows: Unsized paper (filter paper, for instance) is immersed in a cold saturated solution of potassium nitrate, and afterwards hung on cords and dried. When dry it is aromatized by being plunged into an alcoholic solution of gums, resins, sweet-smelling balsams, etc., the composition of which may be varied to suit the taste. The following are examples of such balsamic solutions:

Musk	10 parts.
Attar of rose	1 part.
Benzoin	100 parts.
Myrrh	12 parts.
Orris root	250 parts.
Alcohol	300 parts.

Mix, let stand for one month, and filter. Another is as follows:

Benzoin	80 parts.
Balsam of tolu	20 parts.
Styrax	20 parts.
Sandal-wood, rasped	20 parts.
Myrrh	10 parts.
Cascarilla	20 parts.
Musk	1 part.
Alcohol	200 parts.

Mix, and treat as above.—Pharm. Post, 1893, 320.

Baume de Commandeur.—The Chem. and Drug. gives the following:

Angelica root	10 parts.
Hypericum herb	20 parts.
Myrrh	10 parts.
Olibanum	10 parts.

Aloes	10 parts.
Balsam of tolu	60 parts.
Benzoin	60 parts.
Rectified spirit	650 parts.
Water	70 parts.

Make a tincture by maceration.

Bi-Electrolysis.—Dr. Foveau de Cornelles describes some applications in medical practice of bi-electrolysis or the electrolysis of two substances at the same time.—Pharm. Jour. Trans., 1893, 687; from Univ. Med. Jour., 1, 10.

Benedictine Cordial—Origin of—And its Revival at Fécamp.—Pharm. Era, 1892, 74.

BLOOD.

Blood—Identification of.—C. O. Curtman in a lengthy paper gives a table of the diameter of red blood corpuscles in micromillimetres as obtained by different investigators. He considers the chemical character of oxyhæmoglobin, methæmoglobin, sulpho-methæmoglobin, hæmoglobin, hæmochromogen and hæmatin. He also describes the spectroscopic examination of blood and the detection of poisoning by inhalation of carbon monoxide gas.—Meyer Bros.' Drug., 1893, 40–45.

Proof of Presence of Blood by Sensitiveness of the Hæmatin Spectrum and the Formation of Hæmin Crystals as.—Janecek finds that not only the blood but also the excrement of insects living on higher animals, contains the perfect blood corpuscles of the higher animals from which it was originally obtained. Consequently the spectrum of these materials was very similar to that of the blood of the higher animal, and the hæmin crystals could be obtained in quantity.—Chem. Centralb., 1892, 507.

Blood Stains—Chemico-legal Examination of Suspected.—Struve confirms the observations of Janecek, that hæmin crystals can be obtained from the excrement of flies which have been fed with blood, but on treating the flies themselves with alcohol (70 per cent.) and with ammoniacal alcohol, he was unable to observe any trace of the characteristic absorption spectrum of blood.—Zeitschr. f. anal. Chem., xxxii., 174.

Blood—Spectroscopic Examination of.—G. Bider.—Arch. der Pharm., 1892, 609.

Coagulation of Blood.—Although accepting in the main the conclusions of Arthus, Pagès and Pekelharing, as to the part played by calcium salts in coagulation, Griesbach believes that he has succeeded in showing the important part played by the amœboid cells of the blood, by the fact that reagents, like weak osmic acid, which fix these cells, prevent the blood from coagulating.—Abstract, Jour. Chem. Soc., 1892, 1112.

Calcium Salts and Coagulation.—S. Ringer.—Ibid.

Corpuscles of the Blood.—Method of Estimating the Volume of the.—M. and L. Bleibtreu.—Abstract, Jour. Chem. Soc., 1893, 331.

——— O. Lange.—Ibid., 332.

Red Blood Corpuscles—Volume and Amount of Proteid in Single.—Wendelstadt and Bleibtreu.—Ibid.

Blood of Crustacea—Blue Coloring Matter in the.—Contrary to the usual statement, Heim finds that the blood of crustacea contains serum identical in its properties with that of the vertebrata, and paraglobulin derived from the serum. Dialysis consequently yields a mixture of hæmocyanin with a large quantity of serum, and not pure hæmocyanin.—Compt. rend., cxiv., 771.

Dextrose in Blood.—Pickardt.—Abstract, Jour. Chem. Soc., 1893, 81.

Defibrinated Blood.—Influence of Acids and Alkalies on.—Hamburger. Abstract, Jour. Chem. Soc., 1893, 332.

Glycogen in Blood.—Occurrence of.—Salomon.—Abstract, Jour. Chem. Soc., 1893, 333.

Glycogen in Blood—Occurrence of.—Huppert confirms the presence of glycogen in blood.—Chem. Centralb., 1892, 873; Jour. Chem. Soc., 1893, 176.

Glycolysis in Blood.—Arthus in Compt. rend., cxiv., 605.

Fermentation in Blood.—Berthelot and André.—Ibid., 514.

Hæmocyanin.—Fredericq confirms the statements of Krukenberg, Haliburton, Griffiths and others.—Compt. rend., cxv., 6.

——— *Respiratory Value of.*—Cuénot.—Ibid., 127.

Hæmoglobin—Colorimetric Estimation of.—Hoppe-Seyler recommends that the standard should be a normal solution of carbonic oxide hæmoglobin instead of the tinted glass, carmine, etc. The carbonic oxide hæmoglobin for comparison should be prepared in large quantities, and in well-stoppered bottles it keeps for years. Its strength can be estimated in a sample. The liquid to be investigated should, by means of a stream of carbonic oxide, have its hæmoglobin converted into carbonic oxide hæmoglobin. It is then diluted until its color is the same as that of the standard. The amount of dilution being known, the strength of solution is easily ascertained. The instrument used is termed a capillary double pipette. For illustration and description see Jour. Chem. Soc., 1892, 1264.

Blood and Lymph.—Diastatic Action of.—Bial.—Abstract, Jour. Chem. Soc., 1893, 333.

Oxygen in Oxyhæmoglobin Crystals.—Bohr and Torup.—Abstract, Jour. Chem. Soc., 1892, 1017.

Oxyhæmoglobin from Hæmatin and a Proteid.—Formation of.—Sans and Moitessier.—Compt. rend., cxiv., 923.

Oxyhæmatin, reduced Hæmatin and Hæmochromogen.—Bertin-Sans and Moitessier.—Compt. rend., cxvi., 401.

Hæmatin and Hæmochromogen—Action of Carbonic Oxide on Reduced.—Ibid., 591.

Bread in Diabetes.—Cathelmeau and Lebrasseur in Jour. Pharm. Chim., 1893, 268.

Diabetic Bread.—Helbig in Pharm. Centralh., 1893, 283.

Aleuronat in Diabetes.—See Aleuronat.

Castor Oil Chocolate.—From Süd.-Deutsche Apoth. Zeit.

Castor oil	50 parts.
Cacao, deprived of oil	50 parts.
Pulverized sugar	100 parts.
Peppermint oil, sufficient to flavor.	

Heat the oil and cacao in a water-bath, with constant stirring. When well mixed add the peppermint oil and the sugar. Stir in thoroughly, and then pour on a slab. Divide into suitable doses.

Castor Oil—Palatable.—

Castor oil	fl. ℥ iij.
Yolk of egg	fl. ℥ iv.
Oil bitter almonds	gtt. ij.
Milk, enough to make	fl. ℥ iv.

The dose of this is the same as that of pure castor oil. It is taken diluted with milk, sweetened water, or wine. The oil should be added slowly to the yolk of egg, triturating thoroughly; then the two other ingredients are added.—Merck's Bulletin, March, 1893.

Castor Oil—Methods of Administering.—Meyer Bros.' Drug., 1892, 381.

Chilblains—Cure for, Issued by the Würtemberg Government.—Mutton tallow and lard, of each ¾ pound av.; melt in an iron vessel, and add hydrated oxide of iron 2 ounces, stirring continually with an iron spoon, until the mass is of a uniform black color; then let it cool and add Venice turpentine 2 ounces, Armenian bole 1 ounce, oil of bergamot 1 drachm. Rub up the bole with a little olive oil before putting it in. Apply several times daily by putting it upon lint or linen.

Coffee—Purgative.—The Portuguese Pharm. contains the following:

Magnesium sulphate	100 parts.
Senna leaves, exhausted by alcohol	35 parts.
Roasted coffee	30 parts.
Jalap	3 parts.
Oleosaccharate of anise	2 parts.

Powder and mix. The dose for an adult is 5 drams, which should be infused for twenty minutes in 5 ounces of water. It may be taken hot or cold.

Corn-cure.—The following formula from Jour. de Pharm. et de Chim., Feb., 1893, 248: Dissolve extract of Indian cannabis 1 part, salicylic acid 10, turpentine 5, in collodion 82, and add 2 parts acetic acid.

Creosote—New Method of Administering.—F. Lascar proposes the following: Extract of malt and cod-liver oil containing 30 per cent., of the oil is triturated in a mortar with the creasote, and flavored by oil of bitter almond and oil of lemon, the formula being:

Malt and cod liver oil	8 fl. oz.
Beech wood creosote	80 mins.
Oil of bitter almonds	4 mins.
Oil of lemon	6 mins.

This mixture keeps well and seems to be permanent; even when kept for a considerable time, it remains homogeneous and loses neither in odor nor taste.—Drug. Circ., 1892, 244.

Creosote rendered Soluble in Water.—M. Carles.

Creosote, from wood tar	10 Gm.
Tincture of quillaya	80 Gm.
Distilled water	60 Gm.

Mix. Each teaspoonful of this mixture contains 1 Gm. of creosote, and is perfectly soluble in any desired quantity of water, hot, tepid, or cold.

That the creosote is fully dissolved, M. Carles proves thus: When an alcoholic solution of creosote is poured into water, the vessel may afterwards be emptied, washed and dried, and will yet preserve the creasote odor, while after emptying the quillaja solution a simple rinsing with water will remove all odor.—Rép. de Pharm., 1893, 199.

Creosote—Solution of.—Vizern criticises the formula proposed by P. Carles on account of the large proportion of tincture of quillaja used. Almond oil soap of the French Codex is recommended.—Jour. de Pharm. et de Chem., 1893, 593.

——— E. Hirschsohn.—Pharm. Zeitschr. f. Russ., 1893, 116; Pharm. Centralh., 1893, 196.

Poisonous Creosote.—Review of this subject by J. B. Nagelvoort.—There is much poisonous creosote in the market; the author recommends guaiacol instead.—Bull. Pharm., 1892, 558.

Creosote—Elimination of.—Creosote, in whatever form administered, according to Dr. Imbert (Bull. gén. de Thér., Sept., 1862), is chiefly eli-

minated through the kidneys, the greatest part being found in the urine during the first twelve hours, while the quantity expectorated is insignificant.—Am. Jour. Pharm., 1893, 17.

Croup—Treatment of.—Bonain (Rev. laryng., otolog. et rhinolog., Aug., 1892) advises the following treatment of cases of croup: (1) Potion: lactic acid, 3 Gm.; syrup of tolu, 50 Gm.; water, 100 Gm. Dose—half a teaspoonful every hour. (2) Inhalations of a coffeespoonful of the following mixture every two hours: carbolic acid, 1 Gm.; alcohol (90 per cent.), chloroform, each 10 Gm. (3) Injections with a Pravaz syringe morning and evening into one of the infra-spinous fossa: oil of turpentine, 2 Gm.; paraffin oil, 10 Gm.—Am. Jour. Pharm., 1892, 607.

Cutaneous Eruptions by Drugs.—D. L. Lewin, at the Second International Congress of Dermatologists at Vienna, expressed the opinion that the cutaneous eruptions resulting from the administration of drugs are caused by the abnormal products of decomposition, chiefly of an albuminous character. The author, in summarizing the incidental effect of 402 remedial substances, found 50.7 per cent. to affect the epidermis, without considering the pure caustics, as follows: After internal administration, 27.1 per cent.; after internal and external use, 10.1 per cent.; and after external application, exclusive of caustics, 13.4 per cent.—Pharm. Post, xxv, p. 1119.

Dental Histology.—F. B. Baker describes methods of section-cutting and the preparation of microscopic specimens.—Pharm. Jour. of Aus., 1892, 249.

Sections of Teeth.—A. H. Smith's method of preparing sections of teeth so as to demonstrate the hard and soft tissues in combination will be found in Jour. Brit. Dent. Assoc., xiii, 579. Abstract in Pharm. Jour. Trans., 1892, 347.

Dental Alloy—Refining.—H. W. Warren describes a quick method for refining dental alloy.—Chem. News; Pharm. Jour. and Trans., 1892, 326.

Dental and Buccal Antisepsis.—Dr. Millon, (Monit. thérap., through Journ. Pharm. Chim., 1892, 624) prescribes the following mouth-wash for the above purpose, a tablespoonful to be used with a tumbler of lukewarm water: Thymic acid (thymol) 0.25; benzoic acid 3.00; tincture of eucalyptus 15.0; alcohol 100.00; oil of peppermint, 0.50 gm.—Am. Jour. Pharm., 1892, 406.

Toothache Drops.—Formulas.—Pharm. Post, 1892, 842.

Toothache Drops.—(I) Oils of cajuput and cloves, each 1.0; chloroform, 2.0. (II) Camphor and chloral hydrate each, 2.0; spirit of peppermint, 1.0. (III) Tincture of cannabis indica, oil of cloves and chloro-

form, each, 2.0. (IV) Tinct. opii crocat., olei menth. pip., spir. æther., āā 2.0.

Coca Tooth Paste.—

Soap, medicinal	30 Gm.
Venetian talc	100 Gm.
Cuttle fish bone	20 Gm.
Tincture of coca leaf (1 : 5)	20 Gm.
Oil of peppermint	3 Gm.
Oil of cascarilla	1 Gm.
Oil of linaloes	2 Gm.
Carmine	2 Gm.
Glycerin, sufficient.	

Eucalyptus Tooth Paste.—

Precipitated chalk	50 Gm.
Venetian talc	30 Gm.
Starch	20 Gm.
Soap, medicinal	20 Gm.
Eucalyptol	2 Gm.
Peppermint oil	1 Gm.
Geranium oil	1 Gm.
Oil of clove	10 min.
Oil of anise	10 min.
Carmine	1 Gm.
Glycerin, sufficient.	
Alcohol, sufficient.	

Thymol Mouth or Tooth Wash.—

I. Rhatany root, coarsely powdered	500 Gm.
Cinnamon	100 Gm.
Orange peel coarsely powdered	150 Gm.
Alcohol	2 liters.
Water	1 liter.

Mix, and macerate for fourteen days in a warm place, then filter carefully, and to the filtrate add 15 gm. thymol, and dissolve.

A teaspoonful of this liquid added to a glass of warm water for each collutory.

II. Thymol	25 cg.
Benzoic acid	3 Gm.
Tincture of eucalyptus	15 Gm.
Oil of wintergreen	25 drops.
Absolute alcohol	100 Gm.

Mix. A teaspoonful added to a half glass of water, to be used as a collutory and dentifrice.—Nat. Drug.

Tooth Soap.—Miller in Jour. Brit. Assoc.; Am. Drug., 1892, 114:

Pure white soap	60	parts.
Tincture of krameria	20	parts.
Precipitated chalk	22	parts.
Benzoic acid	3	parts.
Potassium chlorate	5	parts.
Borax	5	parts.
Saccharin	1	part.
Oil of cinnamon	0.025	parts.

Tooth-soaps—Hard.—Precipitated chalk, 8.0; carmine, 0.2, dissolved in water of ammonia; powdered soap, 20.0; peppermint oil, 0.5; alcohol, 3.0; after moulding it is to be dried. *Soft.*—Precipitated chalk, 20.0; carmine, 0.2, dissolved in water of ammonia; powdered soap, 5.0; peppermint oil, 0.5; syrup, glycerin, and alcohol, of each sufficient. *Liquid.*—Soap liniment, 100.0; tincture of myrrh and glycerin, each, 20.0; oil of peppermint, 0.5; color to suit.

Tooth Balsam.—Extract of opium, camphor, and Peruvian balsam, each, 1.0; powdered mastic, 2.0; chloroform, 20.0; to be applied on cotton.

Tooth Cement.—Pure zinc oxide, 98.0; magnesia, 2.0; glacial phosphoric acid, q. s.; the powders are to be mixed in a warm mortar, with sufficient melted acid to make a paste; it is to be used at once, as it rapidly hardens.

Tooth Wax.—Wax, 30.0; Venetian turpentine, 12.0; powdered mastic, 5.0: powdered opium, 3.0; chloral hydrate, 2.5.

Tooth Wash.—Tannin, 5.0; tincture of iodine and tincture of myrrh, each, 2.5; potassium iodide, 1.0; rose water, 180.0; a teaspoonful in a glassful of warm water used as a wash will prevent decay and loosening of the teeth.

Antiseptic Tooth Wash (Cordin).—Saccharin, 1.0; sodium bicarbonate, 0.5; alcohol, 100.0; oil of peppermint, gtt. xi.—Apotheker Ztg., 1892, 347; Am. Jour. Pharm., 1892, 463.

Toothache Paste.—In Pharm. Presse:—

Hydrochlorate of cocaine	8 parts.
Hydrochlorate of morphine	8 parts.
Creosote sufficient to make it into a soft paste.	

Mix. Place into the cavity of the aching tooth.

Dentifrices, Liquid.—Formulas for.—Pharm. Record, 1892, 195, 329, 342, 406.

——— *Paste.*—Formulas for.—Ibid., 423.

Powder.—Formulas for.—Ibid., 215, 307.

SURGICAL DRESSINGS.

Surgical Dressings—Aseptic and Antiseptic.—S. W. Williams.—Pharm. Record, 1893, 245–250; Chem. and Drug., 1893, 735.

Acid Sublimate Dressing.—A. Levy uses 5 parts of tartaric acid to 1 of corrosive sublimate.—Bull. Pharm., 1893, 109.

Antiseptic Paper.—The Therap. Gaz., xvi, 757; Bull. Pharm., 1893, 107, gives the following formula:

Bichloride of mercury	2½ drachms.
Glycerin	6 drachms.
Boiled and cooled distilled water	1 pint.

Impregnate unsized paper with this solution and allow to dry.

Antiseptic Powder—Improved.—Bull. Pharm., 1893, 162.

Salol, powdered	1 ounce.
Sulphite of zinc, powdered	1½ ounces.
Benzoin, powdered	½ ounce.
Purified talcum	2 ounces.
Oil fennel	20 minims.

A New Antiseptic Mixture.—Dr. Cavazzini (Rif. Med., through Nouv. Remédes, 1892, 436) recommends, for dressings, the following antiseptic powder: Iodoform 55 parts, salicylic acid and bismuth subnitrate each 20 parts, camphor 5 parts. The powder is of a yellow color and free from disagreeable odor. Torpid and fungoid granulations are favorably influenced and suppuration is greatly diminished.—Amer. Jour. Pharm., 1892, 607.

Mercuric Sozoiodol Dressing.—This preparation contains 38 per cent. of iodine and 31 per cent. of mercury. It may be employed in pomades, powder or emulsion.—Rev. gén. de clin. et de Thérap., Nov., 1892; The Amer. Therap., 1893, 189.

An anti-emetic mixture used at the Charity Hospital of New York City is made as follows:

Creosote	12 minims.
Diluted hydrocyanic acid	30 minims.
Powdered gum arabic	6 drachms.
Powdered sugar	6 drachms.
Water	q. s. ad 2 fluidounces.

A teaspoonful as required.—Bull. Pharm., 1893, 17.

Vegetable Medicines of the Ipecac Class.—H. H. Rusby.—N. Y. Med. Jour., 1893, 158.

Ether as a Menstruum in Medication by the Skin.—J. Sawyer. Of the medicaments for enepidermic use, the oily liniments and the ointments, because of their easy admixture with the sebaceous secretion of the human skin, are probably the most active. The structure of none of the fourteen

plasters of the British Pharmacopœia is such as to permit the absorption of its active ingredients by the skin. The body of an official plaster is made of litharge in union with oleic, margaric and stearic acids, or of wax, of lard, of frankincense, of resin, of soap, of suet, and of some fixed oils, in various combinations. "Neither a plaster so formed nor a solution in alcohol of the active principles of drugs is a scientific medicament for enepidermic employment and percutaneous action, if we have regard to the structure and physiology of the human skin." In practice it is found that there are at least three separate obstacles to the absorption of a medicine through the skin, namely, the fatty sebaceous secretion of the skin, the epidermis, and insolubility of the drug. Ether is the best menstruum for the solution of many remedies for local use through the skin. It is a good solvent of the active principles of many drugs, and it is a ready solvent of the fatty constituents of the sebaceous secretion of the skin. An ethereal liniment supplies the most intimate application of a remedy to the bare dermal surface.

Chloroform has many disadvantages, but ether is an excellent agent, for use either as a menstruum, in tinctures for external employment, or as a simple solvent for the preparation of a liniment.

He proposes and uses several ethereal tinctures for dermal employment; namely, of belladonna (tinct. bellad. ætherea), of capsicum, of iodine and of menthol. Physicians and pharmacists will find other useful developments of ethereal preparations as remedies applied to the skin.—Pharm. Jour. and Trans., 1892, 301; Am. Jour. Pharm., 1892, 624.

Eye Washes—Formulas for.—Nouv. Rem., 1893, 55; Am. Jour. Pharm., 1893, 230.

Fabrics—Dangerous.—A writer in the Mercure Scientifique calls attention to a new source of danger, in the composition of some recently introduced fabrics. These appear to be prepared from denitrified pyroxylin by dissolving it in a suitable solvent and manipulating it in such a manner as to produce threads, which are then woven into cloth. It is asserted that persons clothed in garments made from such material and standing near a fire have suddenly found themselves enveloped in flame, the articles of dress being instantly consumed and but an insignificant residue left, the phenomena resembling those characterizing the ignition of gun-cotton.—Pharm. Jour. Trans., 1892, 350.

Medicated Wools—The Examination of Some.—J. Henry Hoseason examined carbolic, boric and sublimated wools. His results tend to show that they are either badly prepared or, after being made, are badly kept; possibly a combination of these reasons.

Compressed Gases—On the Medicinal Uses of.—C. B. Lowe. An ar-

ticle upon the uses of compressed oxygen and nitrogen monoxide gases in medicine. As the use of these compressed gases by the medical profession will become more frequent pharmacists can add to their stock cylinders of compressed gas, and be ready to supply them at a moment's notice as they would any other remedy.

Oxygen is indicated in diseases of the respiratory organs, characterized by difficulty in breathing, such as asthma, croup, etc., also in the early stages of phthisis pulmonalis; in chronic indigestion, and especially in asphyxia from poisonous gases, such as carbon monoxide, etc. In the latter case its use may be invaluable. In using the apparatus the compressed gas is first conducted into a rubber bag or a metallic gas receiver, from the former of which it is inhaled under ordinary pressure, the gas passing through a bottle partly filled with water. If to be used as an enema, the gas is displaced from the receiver by water flowing from a can placed about 22 inches above the receiver, and is passed through a bottle, containing warm water, to the patient.

Nitrogen monoxide is used in the same way for inhalation, but when used as an anæsthetic, of course the face-piece as used by dentists should be employed.—Am. Jour. Pharm., 1892, 601.

Goitre—Iodine in the Treatment of.—While iodine has long been used in the treatment of this disease, E. Nazaries gives the following new method of its administration, which he claims to have used with unqualified success: Potassium iodide, 5 to 8 Gm.; tincture of iodine, 20 to 30 drops; and distilled water, 150 Gm. A spoonful of this should be diluted with half a liter of water, and this quantity taken daily, during and after meals. The author attributes the favorable results of this treatment to the continued action of the medicaments taken internally.—Bull. de la Soc. de Pharm. de Bordeaux, Feb., 1893, 51; Am. Jour. Pharm., 1893, 229.

Hæmostatic—Chloroform as a.—G. Foy, Med. Press and Circ., London, 1893, 355.

Atropine—Hæmostatic Effect of.—M. B. Blumenau.—Med. Obsh., Mosk., 1892, 838.

Hæmorrhage—Subcutaneous Salt Injection for.—A. S. Thayer.—M. and S. J., 1893, 85.

Homœopathy.—T. S. Wokes.—The essence of the system; important features of homœopathic dispensing; homœopathic tinctures and triturations.—Brit. and Col. Drug.; Pharm. Record, 1893, 154.

Huile de Noisette.—Drog. Zeit.—Finest olive oil, 2500 parts; hazel nut oil, 2500 parts; bergamot oil, 100 parts; clove oil, 10 parts; attar of rose, 5 parts; cinnamon oil, 5 parts. Mix, and, if necessary, filter through a covered filter.

Hypodermoklysis.—H. A. Hare states that hypodermoklysis is a method of supplying fluid to the body to replace that lost through excessive purging, as in cholera or in cases of hemorrhage. It is also used to wash out from the body various impurities circulating in the blood or other liquids, and to flush out the kidneys.—Therap. Gaz., 1892.

Hyperacidity of the Stomach—Atropine in.—See Atropine.

Inhalation Flask.—Simon has devised a practicable flask for the inhalation of ethereal oils and other volatile antiseptic substances. It is made by the Poncet Glass Works of Berlin.—Phar. Centralh., 1892, 400; from Deutsche Med. Ztg., 1892, 183.

Iodoform Substitutes.—Brit. and Col. Drug., Jan., 1893.

——— Chas. Rice has devised the following:

Biniodide of mercury	1 part.
Powdered boric acid	1000 parts. M.

—Pharm. Record, 1893, 83.

Laxatives.

Aloin, Cathartic Acid, Colocynthin and Citrullin, as Laxatives—Local Application per Rectum of.—Pharm. Post, 1892, 1249; Trans. Bull. Pharm., 1893, 278.

Lymph—Glycerin and Vaccin.—Copeman.—Pharm. Jour. Trans., 1893, 4; from Brit. Med. Jour., 1694, 1256. Preservation by mixing equal volumes of vaccine lymph, glycerin and water.—Pharm. Jour. Trans., 1893, 608.

Lymph—Diastatic Ferment in.—F. Röhmann.—Ibid.

Magnesium Sulphate.—According to Suckling, magnesium sulphate administered as a purgative to the mother, also causes looseness in the nursling, while senna, cascara and aloes rarely affect the child's bowels.—Amer. Jour. Pharm., 1893, 359.

——— According to E. D. Oesch (West. Drug.), is best administered in compound elixir of taraxacum, N. F., combining equal measures of the latter and a 50-per cent. solution of the salt. This dose should be followed by a copious draught of water.

Menthol in Dermatology.—Formulas of Colombini in Amer. Drug. and Pharm. Record, 1893, 370. From Gior. Ital. dei malatt ven.

Ointments, Liniments and Drenches—Formulas for.—Pharm. Era, 1892, 204.

Pawn: An Indian Luxury.—Pharm. Record, 1892, 6.

Pharmaceutical Preparations—Selection of Formulas.—See Pharm. Era, for 1892 and 1893.

Pomade—Castor Oil.—From Chem. and Drug.:

Spermaceti	62 parts.
Castor oil	155 parts.

Melt together in the water-bath, and add under constant stirring 155 parts of alcohol. Warm together 60 drops bergamot oil, 8 drops neroli oil, 8 drops clove oil, 8 drops verbena oil, and 8 drops of attar of rose; add to the above while hot, and mix thoroughly.

——— *Potassium Iodide.*—Peyronult's formula, which furnishes an unalterable product:

Potassium iodide	4 parts.
Glycerin	10 parts.
Vaselin	20 parts.

Misce secundum artem.

A Substitute for Liniment and Ointment of Potassium Iodide.—Wm. Lyon. The author suggests the following:

Iodide of potassium	60 parts.
Distilled water,	
Glycerin, of each	60 fluid parts.
Lanoline,	
Vaseline, of each	110 parts.

Melt the lanoline and vaseline together in a warm mortar, and stir until cold. Dissolve the iodide in the water, add the glycerin, and incorporate it with the base by trituration.—Phar. Jour. Trans., 1892, 456.

Pagliari Water.—The formula for this old hæmostatic is:

R.	Alum	100 grams.
	Benzoic acid	2 grams.
	Tincture of benzoin	10 grams.
	Water, sufficient to make	1 liter.

The benzoic acid and tincture of benzoin are added to the alum dissolved in hot water; stir, cool, and filter.—Union Pharm.; Bull. Pharm., 1892, 521.

Simplified Method of Posology, by trituration and solutions.—J. Raymond.—Ann. Soc. Méd.-Chir. de Liége, 1892, xxxi, 282.

Poudre aux Fleurs d'Italie.—This toilet powder has the following formula, according to Der Seifenfabrikant:

Powder of musk roses	50 parts.
Powder of white roses	50 parts.
Jasmin powder	25 parts.
Powder of orange flower	25 parts.
Powder of tuberose	25 parts.
Powder of jonquil	25 parts.
Orris powder	20 parts.
Clove powder	10 parts.
Ambergris	5 parts.
Musk	5 parts.
Finest rice flour	500 parts.

Mix thoroughly and sift through silk. This powder, says our contemporary, "ist theuer aber hochfein," *i. e.*, comes high, but is lovely.—National Druggist.

Quinine—A Non-Bitter Solution of.—A German mixture is made as follows:

Sulphate of quinine	15	grains.
Dilute sulphuric acid	15	minims.
Saturated solution of saccharin	3	fluidrachms.
Spirit of peppermint	$2\frac{1}{2}$	fluidrachms.
Water	$5\frac{1}{2}$	fluidounces.

—Bull. Pharm., 1893, 107.

Toxicological Reactions.—Notes on reactions for lead, digitaline, morphine and solanine.—L. Hugounenq in Jour. Pharm. Chim., 1893, 14.

Atropine and Pilocarpine.—Morat and Doyon. These two drugs act in an inverse way on the respiratory movements; atropine accelerates and pilocarpine retards them. They antagonize one another when administered successively.—Abstract., Jour. Chem. Soc., 1893, 222.

Morphine, Picrotoxin and Paraldehyde.—J. Kossa. Although morphine and picrotoxin exert an opposite action on the respiration and blood-pressure, yet the toxic symptoms of morphine are only increased by administration of picrotoxin. Paraldehyde, on the other hand, is a specific against picrotoxin, and the three drugs can be administered together in lethal doses without danger. Dr. Kossa also indirectly establishes an antagonism between paraldehyde and morphine, which, though weaker than that between paraldehyde and picrotoxin, is greater than that between morphine and atropine.—Bull. Pharm., 1892, 522.

Morphine in the Saliva.—J. Rosenthal. L'Union Méd., March 23, 1893; Pharm. Jour. Trans., 1893, 990.

POWDERS.

Sweet (Sweat?) Powder.—W. A. Michel, Bull. Pharm., 1892, 554:

Powdered cardamom seed	1 drachm.
Bicarbonate of sodium	2 drachms.
Chloride of potassium	2 drachms.
Calomel	4 drachms.
Corn starch	8 drachms.
White sugar	8 drachms.

Smoke Powders in the Treatment of Asthma—Dangers of Inhalation.—J. B. Bullard says that it is possible to produce with these powders an atmosphere so full of narcotic vapors and so lacking in necessary oxygen as to produce a gradual asphyxiation.—The South. Cal. Pract., 1892, 471; Amer. Jour. Med. Sci., 1893, 318.

A Truss Dusting Powder.—Garmo recommends the following:

Powdered talc	2 ounces.
Powdered starch	4 ounces.
Dried alum	2 drachms.
Boric acid	2 drachms.
Phenol	30 minims.
Oil of lemon	30 minims.

Bull. Pharm., 1892, 604.

Anodyne Sinapisms.—According to an exchauge, mustard can be used advantageously as the menstruum for anodynes in the form of external application, and without destroying its value as a counter-irritant. The mode of application consists in mixing the mustard into a thick liquid with olive oil or with glycerin, and then incorporating the anodyne, opium, tincture of aconite, cocaine, belladonna, or other narcotic. The vascularity caused by the mustard favors absorption, and an insensibility amounting to a slight local anæsthesia can be induced by this simple method.—Notes on New Rem., 1893, 143.

Saliva—Color Reaction of.—By Rosenthal.—Berliner Klin. Woch., Bull. de Pharm. de Bruxelles, xxxvi, 236; Pharm. Jour. and Trans., 1892, 264.

Purification of Sewage with Ferric Sulphate.—A. and P. Bruisine.—Bull. Soc. Chim. de Paris; Abstract, Chem. News, 1893, 25.

Skatological Medication.—Discussion of skatological literature in Brit. Med. Jour.—West. Drug., 1892, 422.

Stomach Washing—The Syphon-Tube for.—D. Harvey Attfield in the Practitioner, 1892, in an article on "The Treatment of Chronic Gastric

Affections by Washing out the Stomach," describes the instrument and operation.—See West. Drug., 1892, 378.

Styptic—A Physiological.—According to A. E. Wright (Lancet, 1893, No. 3626) a styptic of great coagulative power, acting directly on the blood, may be made as follows:

Take the thymus gland (chest sweetbread) of a calf, reduce it to a fine pulp by passing it through a sausage machine, and extract with 3 to 4 liters [about 3 to 4 quarts] of a 1 to 2 per 1,000 solution of carbonate of sodium which has received an addition of 5 grams [1 fl. dr.] of chloroform per liter. Stir thoroughly at intervals and continue the extraction for twenty-four to thirty-six hours. At the expiration of that period it will be found that almost the entire substance of the gland has dissolved in the dilute alkaline fluid. Strain through fine calico and add 1 per cent. of calcium chloride. In order to obviate the considerable precipitate of calcium carbonate which is obtained on this addition, it is well to acidify the thymus extract with dilute hydrochloric acid before adding the lime salt. The slight alkaline reaction is to be subsequently restored by an addition of weak caustic soda. Preserve in stoppered bottles.

This styptic will keep for an indefinite time if the chloroform is prevented from evaporating. With a styptic prepared as above the investigator has been able to arrest the hemorrhage after cutting across both a femoral and a carotid artery in a dog. The action of the styptic was assisted by compressing the arteries for one or two minutes.

The styptic may be applied on a tampon to any bleeding surface where strict asepsis can be dispensed with. If it is necessary to render the styptic perfectly aseptic, this can be done by boiling after making a sufficient addition of alkali to keep the albuminous substances in solution. Boiling involves a great, but not a complete, loss of coagulating power.

Tænifuge.—In the case of a child troubled with *Tænia inermis*, pumpkin seed and pelletierine tannate afforded no relief; but the parasite was promptly expelled by an emulsion consisting of oleo-resin of male fern, 3; tincture of vanilla, 3; syrup of turpentine, 25; water, 25, and gum arabic, 2 Gm. The emulsion mixed with an equal quantity of milk was taken in one dose, and two hours later castor oil, 15 Gm., was given.—Am. Jour. Pharm., 1892, 469.

Moussena Bark for Tapeworm.—M. Bouchet, (Lyon Méd., Nov. 20th, 1892), a pharmacist, recommends to the Society of Therapeutics the following formula: Fast in the evening; in the morning take three or four pearls of ether, and one hour later administer the following decoction:

Water	800 grams.
Bark of the pomegranate root	60 grams.
Moussena bark	60 grams.

Reduce the solids to a coarse powder, boil, strain, moisten the residue with a little water, and replace on the fire and evaporate to about a glassful. One hour after taking this there generally follows an abundant evacuation,which contains the entire tænia.—The Am. Therap., 1893, 188.

Tæniafuge—Duhourcau's.—Bull. Pharm., 1893, 73.

Male fern (ext.?)	1.20 grammes.
Chloroform	3.60 grammes.
Castor oil	3.60 grammes.
Croton oil	½ minim.

Divide into twelve capsules.

Iodized Tannin.—Barnouvin (Pharm. Centralh., 1892, 528) states it to be prepared as follows: To a solution of tannin a solution of iodine is added in such proportions that the mixture gives no reaction with starch after standing for two hours. The solution is then evaporated to the consistency of a thick syrup, and spread on glass to dry in the drying closet. It forms shining, brownish-yellow lamellæ, which are readily soluble in water and alcohol, but less so in glycerin. Its aqueous solution is stable.

Terra Silicea (Kieselguhr).—Oefele finds this an excellent substance from a therapeutical standpoint for the impregnation of liquids.—Pharm. Centralh., 1892, 751.

Tubuli Elastici Medicamentosi.—E. Lang prepares these by thickly coating rubber tubing with gelatin, to which a suitable medicament has been added. After rubbing over the surface vaselin, glycerin or other preparation, the tubule is ready for use. The gelatin coating consists of gelatin, glycerin and water, which covers the 4 mm. rubber tube to within 1 cm. of the end. The other end of the tube is rounded off with a drop of gelatin. The tubules are serviceable in the treatment of chronic and subacute urethritis.

Of sulphocarbolate of zinc, ¼ to 1 per cent. is added to the gelatin. Introduce daily, or every second or third day, one of these tubules. Of tannin, 1 per cent. and upwards is used; of thallin, up to 5 per cent.; of sulphate of copper, up to ¼ per cent.; of lead acetate, up to 1 per cent.; of resorcin, up to 5 per cent. Other medicaments may be applied as well. —Pharm. Post., 1893, 78.

Whooping Cough—Antimony, Phenol and Bromides in.—Liebermeister (Rev. gén. de Clin. et de Thérap., June, 1892) recommends the following treatment:

(1) During the catarrhal period, rest in bed and administer the following mixture: Golden sulphuret of antimony, 0.50, mucilage of gum acacia, 20.00, distilled water, 50.00, simple syrup, 20.00. Teaspoonful every hour or two.

(2) In the convulsive stage: Inhalations of solution of sodium phenate, potassium bromide or sodium salicylate, and a potion of cochineal and potassium carbonate. To combat the paroxysms of cough use narcotics (opium), anæsthetics (morphine), or inhalations of 10–20 drops of ether 4 parts, oil of turpentine 1 part. Lastly give quinine and a potion consisting of extract of belladonna, 0.50; syrup of ipecac, 25.00; wine of antimony, 10.00, and distilled water 150.00 Gm. Dose, from two to six teaspoonfuls during the day.

(3) A sojourn in the country.—Am. Jour. Pharm., 1892, 517.

Wounds, Burns, etc.

First Aids to the Wounded.—J. C. Da Costa. A lecture. P. C. P. Alumni Rep., 1892, 54.

Dressings for Wounds.—An apparatus is figured and described by G. Morpargo for determining the relative power of absorption of different dressings in Pharm. Post., 1893, 317.

——— A method for controlling the sterilization of.—Hochenegg in Pharm. Post, 1893, 318.

Wounds—Antiseptic Treatment of.—Niles. Experiments with lysol, creolin, dermatol, iodol, aristol, zinc oxide and mercuric chloride—of which lysol was the best.—Abstract, Jour. Chem. Soc., 1893, 223.

Thiophendiiodid.—A dressing for wounds.—O. Zuckerkandl in Therap. Monats., 1893, 91; Pharm. Centralh., 1893, 112.

Burns—Bismuth and Boric Acid Ointment in the Treatment of.—Wertheimer (Rev. de Méd., de Chir., et d'Obst.), has formulated the following for the treatment of burns in children: Bismuth subnitrate, 9 Gm.; boric acid, 4.50 Gm.; lanolin, 70 Gm., and olive oil, 20 Gm. The parts should be washed with warm boric acid water, and then several layers of gauze, spread with the ointment, should be applied. For calming the nervous agitation likely to take place, the author prescribes morphine in the dose of 2 to 4 Mgm., and chloral according to the following formula: Chloral, 1 Gm.; distilled water, 50 Gm., and syrup of bitter orange peel, 15 Gm.—Bull. Gén. de Thér., 1893, 232; Am. Jour. Pharm., 1893, 229.

Europhen for Burns.—In Therap. Gaz.; Bull. Pharm., 1893, 156, the following formula is given:

Europhen	45 grains.
Olive oil	2 fluidrachms.
Vaselin	2 ounces.
Lanolin	1 ounce.

Thiol for Burns.—In burns of the first and second degree, where the blebs are still intact, it is only necessary to brush the burned area with equal parts of liquid thiol and water and cover with wool. At the end of eight days the dressing should be changed, and again re-applied if the

blebs have not healed. If the blebs have been ruptured and the corium exposed, all loose skin should be cut away and the burned area carefully cleaned; it should then be brushed with liquid thiol, and powdered with salicylic or boric acid and then with powdered thiol, and the whole covered with vaselin, cotton wool, and bandaged. As a rule, one or two dressings are necessary before the wound has healed.—Notes on New Rem., 1893, 99.

Burns in Children—Treatment of.—Wertheimer recommends the following:

℞. Lime-water ..... ℥iss.
Oil of sweet almonds..... ℥iss.
Thymol ..... gr. ¾ a gr. iss.

Mix, and apply to wounds on a compress.

In severer cases the following may be used instead of the above:

℞. Bismuth subnitrate..... ℥ss.
Boric acid ..... ℥j.
Olive oil..... ℥vj.
Lanolin, q. s. ad ..... ℥iij.

Mix, and make an ointment.

Better than either of the above is the following:

℞. Campho-phenique..... 1 part.
Lanolin ..... 3 parts.

Mix, and make an ointment. Apply freely over the burned surface.—Nat. Drug., 1893, 112.

Dr. Stoy's Remedy for Hydrophobia.—C. L. Lochman reviews the history of this preparation, the properties of which are due to Anagallis arvensis. The latter should be more fully investigated, and its therapeutic value and dose established. It appears that the testimony in favor of this remedy is as strong or stronger than that which supports the Pasteur treatment.—Amer Drug., 1893, 128.

Veterinary Medicines.—Formulas in Pharm. Rund., 1892, 284; 1893, 17.

——— Pharm. Era, 1892, 170.

URINE.

Acetone in Urine—Estimation of.—R. Supino.—L'Orosi, 1892, 217; Jour. Chem. Soc., 1893, 250.

——— M. and A. Jolles.—Wien. Med. Wochenschr., 1892, No. 17 and 18; Zeitschr. f. Anal. Chem., 1892, 723.

Albumen in Urine—The Detection of, by Means of Chromic Acid.—G. Guérin.—Jour. de Pharm. et de Chem., 1893, 362.

Albumin in Urine, Mercuric Chloride as a Reagent for.—E. Spiegler. This reagent is rendered more sensitive if applied in the state of a solution of 8 Gms. sublimate, 4 Gms. tartaric acid and 20 Gms. sugar in 200 C.c. water. If albuminous urine is slightly acidified with concentrated acetic acid and superstratified upon the reagent, there is formed a sharp whitish ring at the plane of contact. The test is even more sensitive than the ferrocyanide reaction. It is not affected by urinary peptone.—Ber. der Chem. Ges.; Chem. News, 1893, 109.

Spiegler's Albumin Reagent has been modified so that it is even a more delicate test for albumin, detecting 1 in 350,000. Its composition: Mercuric chloride, 2.0; tartaric acid, 1.0; distilled water, 50.0; and glycerin, 5.0.—Pharm. Centralh., 1893, 424.

——— *in Bright's Disease—Test for.*—Gerrard finds that under the influence of milk diet the albumin in the urine of persons suffering from Bright's disease is wholly or partially converted into propeptone. While no coagulable albumin can be detected by heating, addition of nitric acid gives a copious precipitate, soluble in excess, and saturated solution of sodium chloride gives a flocculent precipitate, which increases on adding acetic acid. This precipitate consists of propeptone.—Pharm. Jour. and Trans., 1892, 261; Jour. de Pharm. et Chim., 1872, 104.

Albumin Reaction.—B. Vas has experimented with nine different substances and finds trichloracetic acid and sulphosalicylic acid the most sensitive reagents.—Pharm. Zeit., 1892, 451; Pharm. Rund., 1892, 221.

——— Salicylsulphuric acid is used as a delicate reagent for all protein substances, and may be used in the detection of albumin in the urine.—Pharm. Zeit., 1892, 451; Pharm. Rund., 1892, 221.

Albumin—Quantitative Estimation of—in Solution.—G. Marfmann.—Pharm. Centralh,, 1892, 421.

Albumin and Bile Pigments in Urine.—Rosenbach employs a few drops of a 5 per cent. chromic acid solution to the feebly acidified urine; the albumin is precipitated. If bile pigments are present the urine assumes an intense green color.—Chem. Centr., 1892, 557; from Deutsch. Med. Wochenschr., 1892, No. 17.

Albumin and Sugar in Urine—Combined Test for.—Benno Laguer (Pharm. Centralh., 1892, 763), calls attention to the practical application of the following test, which, although not new, is very useful:

(*a*) Five C.cm. of the urine, filtered clear, are heated to boiling in a test-tube, and 2.5 C.cm. of dilute nitric acid added in one portion without further heating. A flocculent precipitate would indicate albumin, which after cooling the solution, is filtered off, and the clear filtrate used for the sugar test with bismuth solution.

(*b*) To the clear solution add 2.5 C.cm. of Almen's solution (4 grains potassium and sodium tartrate in 100 grains of 10 per cent. sodium hydrate

solution, to which are added 2 grains of bismuth subnitrate and digested until dissolved) and boil the mixture for one or two minutes. A deep brown or black color would indicate sugar. Care must be taken to have the solution alkaline during the final boiling.

Ammonium Magnesium Urate.—Guérin and Thorion. This salt $(C_5H_2N_4O_3H)_{10}(NH_4)_8Mg + 45\,H_2O$ is easily obtained by precipitation. On adding magnesium solution to urine, the precipitate contains the whole of the uric acid as well as the phosphoric acid; hence the pyrophosphate resulting from ignition of the precipitate always contains an excess of magnesia, corresponding with the amount of uric acid present in the urine.—Abstract, Jour. Chem. Soc., 1893, 99.

Biliary Pigments in Urine.—Iodine for the Detection of.—Maréchal in Sem. Méd., Feb., 1893; Rép. de Pharm., 1893, 238.

Blood in Urine.—Detection of.—A. Feriars in Boll. farm., 1893, 10; Rép. de Pharm., 1893, 120.

Use of the Centrifugal in the Examination of Urine.—M. Jolles, in Pharm. Post, 1893, 2 and 41, etc.

Creatinine in Urine—Estimation of.—Moitessier objects to the process of Gautrelot and Vieillard. The only process which affords accurate and concordant results he considers to be that of Neubauer.—Bull. Soc. Chim., vi., 907; Jour. Chem. Soc., 1892, 1135.

Gallic Acid in Urine.—See Gallic and Tannic Acids.—Physiological action of.

Gallic and Hydrogentisinic Acid in Urine.—E. Baumann.—Abstract, Zeitschr. f. anal. Chem., 1892, 482.

A Crystalline Globulin occurring in Human Urine.—Paton.—Proc. Roy. Soc. Edin., xix., 102; Jour. Chem. Soc., 1893, 290.

Glycosuric Acid in Urine in Diabetes.—A. Geyger (in Pharm. Zeit., 1892, 1488; Pharm. Centralh., 1892, 618) has found in testing diabetic urine of 1.022 sp. gr., that 0.4 C.c. reduced 10 C.c. of Fehling's solution, although the same quantity of Fehling's solution took 6.4 C.c. of the diluted urine (1 : 3) for reduction. By the fermentation test it was found that the urine contained 1.4 per cent. sugar. By acidifying the urine with sulphuric acid and shaking with ether, a crystallizable substance, melting at 143° C., was obtained, which proved to be the glycosuric acid already noticed by Marshall. It is suggested that in the determination of sugar in urine the possible presence of glycosuric acid must always be kept in view, and that whenever the behavior of the urine towards Fehling's solution is abnormal, the urine must be tested for glycosuric acid, as above described.

Hæmatoporphyrin in Urine—Detection of.—Hammarsten. Zeitschr. f. anal. Chem., xxxi., 233. Owing, it would seem, to the increased use of sulphonal, cases of hæmatoporphyrinuria are becoming more frequent.

Homogentisic Acid in Urine—Estimation of.—E. Baumann.—Zeit. Physiol. Chem., xvi, 268; Jour. Chem., Soc., 1892, 925.

Ethereal Hydrogen Sulphates in Cholera—Excretion of.—Baumann.—Zeit. für Physiol. Chem., xvii, 511; Jour. Chem. Soc., 1893, 290.

Hydrogen Sulphide and Methyl Mercaptan by a Bacterium in Urine—Production of.—Karplaus.—Abstract, Jour. Chem. Soc., 1893, 335.

Iron in Urine—Estimation of.—Damaskin gives two methods, one volumetric, using permanganate, the other depending upon a colorimetric principle.—Abstract, Zeitschr. f. Anal. Chem., 1892, 481.

——— Jacobi.—Ibid., 1893, 121.

Kreatinine in Urine—Determination of.—Gautrelot and Vieillard make 3 separate determinations of nitrogen, one in the original urine, a second in the same after precipitation with basic lead acetate, and a third after precipitation with basic lead acetate and zinc chloride.—Soc. de Med. Prat.; Chem. News., 1893, 33.

Lactic Acid in Blood and Urine.—Summing up of results of a research by Irisawa in Jour. Chem. Soc., 1893, 136.

Leucomaines in Urine—Examination for.—P. Carles in Jour. de Bordeaux, March, 1893; Rép. de Pharm., 1893, 257.

Leucomaine—A New.—A. B. Griffiths has obtained from the urine of epileptics a new leucomaine. It causes trembling, dilatation of the pupils, convulsions, and even death.—Compt. Rend., cxv., 3, 185; Phar. Jour. and Trans., 1892, 85.

Estimation of Nitrogen in the Urine.—A. Petit and L. Monfet report to the Société de Pharmacie their conclusion in regard to this subject. They consider Kjeldahl's method, with several modifications, the most rapid and most exact of all known methods. The process as modified by them is based on the following principles:

(1) Total transformation of the urinary nitrogen, and of the organic nitrogen in general, into ammonium sulphate.

(2) Oxidation and liberation of this ammoniacal nitrogen by a strongly concentrated alkaline hypobromite solution.

10 C.c. urine are introduced into an Erlenmeyer flask, and 5 C.c. fuming sulphuric acid added drop by drop; heat just to ebullition, and then add a small globule of mercury; when the foaming has subsided, raise the temperature and continue the boiling until the acid liquid has become entirely decolorized, when the oxidation of the nitrogen is complete. Now allow it to cool, add gradually 20 C.c. distilled water and cool, under a current of water, and carefully add soda lye, but not to saturation; if this is indicated by a drop of phenolphthaleine solution, several drops of pure sulphuric acid should at once be added. Now pour the contents of the Erlenmeyer flask into a flask of 50 C.c. capacity, and make up the volume

with water which has previously been used to wash the first container; then filter.

Into a graduated tube, closed at one end, containing 20 C.c. mercury and 20 C.c. of hypobromite solution (prepared by the following formula: bromine, 10 C.c.; caustic soda solution, 90 C.c., and distilled water, 75 C.c.), introduce 10 C.c. of the above liquid, which corresponds to 2 C.c. urine, using a solution of potassium acetate as a separating layer.

When the reaction is finished, place the ureometer in a vessel of water, making the levels of the two liquids equal, and note the volume of nitrogen, as well as the temperature and the atmospheric pressure, from which data the weight of nitrogen may be readily calculated; but troublesome calculations may be avoided by using in the manner indicated a solution of 4.714 Gm. of pure dry ammonium sulphate in 200 C.c. distilled water; 1 cgm. nitrogen is yielded for every 2 C.c. of this solution.

The authors have applied this process to substances in which the nitrogen occurs in varied forms. For substances like the pyridine and quinoline bases, in which the nitrogen presents great resistance to oxidation by the Kjeldahl method, they use the smallest possible quantity of water. The following table gives some of their results:

Substance.	Found.	Calculated.	Time Consumed. Hr.	Min.
Dry basic quinine sulphate	7.56	7.50	1	15
Methylamine hydrochlorate	20.72	20.70	—	20
Cocaine hydrochlorate	4.145	4.123	2	—
Aniline	15.35	15.37	2	—
Crystallized eserine	15.19	15.27	—	30
Saccharin	7.78	7.65	1	30
Morphine	4.49	4.62	1	—
Aconitine	2.09	2.17	1	15
Dry albumin	15.45	15.53*	—	30
Dry wool	17.06	17.17*	—	45
Analgesin	15.01	16.09	—	—
Pyridine	15.86	17.7	—	—

* According to Dumas.

Analgesin yielded after two hours, 11.88; after three hours, 13.03, and after four hours, 15.01; and pyridine, after two hours, 14.7, and after four hours, 15.86 nitrogen. In both these substances the oxidation, even after being continued for a long time, still remains incomplete. However, judging from the increase in the results, they hope it will not be impossible to surmount the difficulties.—Jour. de Pharm. et de Chim., March, 1893, p. 297.

——— Arnold and Wedemeyer.—Pflüger's Archiv., 52, 590; Jour. Chem. Soc., 1893, 343.

——— The Excretion of.—G. Gumlich.—Abstract, Jour. Chem. Soc., 1892, 1503.

Pentoses in Urine.—E. Salkowski.—Abstract, Jour. Chem. Soc., 1893, 100.

Peptones in Urine.—Volumetric Estimation of.—The peptone solution is freed from albumin and reducing compounds, and decinormal Fehling's solution is employed, the titration finishing with the rose-purple tint. 1 C.c. of solution equals 0.004 gram of peptone.—Abstract, Jour. Chem. Soc., 1892, 1264.

Phenol in Urine—Volumetric Estimation of.—Kossler and Penny. Comparison of the methods of Koppeschaar and Messinger and Vortmann. The latter is the better in estimating both phenol and small quantities of cresol.—Abstract, Jour. Chem. Soc., 1893, 100.

Phosphoric Acid in Urine.—P. Carles. In analyzing urine, it appears most rational to estimate the total phosphoric acid, noting the reaction of the urine at the moment of its secretion or at the latest when delivered.—Abstract, Jour. Chem. Soc., 1892, 1115.

Ptomaines from Urine.—A. B. Griffiths describes ptomaines obtained from the urine of patients suffering from erysipelas and puerperal fever respectively.—Pharm. Jour. Trans., 1893, 444; from Compt. rend., 115, 667.

Urine—Reducing Agents in Normal.—G. S. Johnson.—Chem. News, 1892, 91.

Urinary Sediments—Microscopical Preparations of.—Von Frisch, in Zeits. Oest. Apoth. Ver., 1892, 801.

Light as a Sterilizer.—A. Richardson found that hydrogen peroxide is formed when sterilized urine is exposed to the light. Proc. Chem. Soc., 124, 121.

Sugar in Urine.—A test for sugar in urine depending upon the formation of indigo-blue is proposed by G. Hoppe-Seyler; the test can be applied directly to the urine, since the albuminoid and coloring principles do not interfere (more than 2 per cent. albumin, however, interferes and must be removed by precipitation with lead acetate); the test is carried out with very small quantities of urine, and it is to be regretted that the quantity of sugar cannot be titrated, but must be approximated from the intensity of the blue color. The examination is made by boiling for 15 seconds ten drops of the urine with 5 C.c. of the reagent (0.5 Gm. orthonitrophenylpropiolic acid and 1 Gm. sodium hydrate in 100 C.c. distilled water); if the test becomes deep-blue, at least 0.5 per cent. sugar is present in the urine. Normal urine added to the reagent in large quantity (1 C.c.) may produce a green coloration, but a distinct blue coloration is not obtainable.—Ztschr. f. Physiol. Chem., 1892, 83; Am. Jour. Pharm., 1892, 524.

Sugar—Detection of Small Quantities.—J. Seegen. Place a filter of 5 to 6 cm. diameter in a funnel and fill to the height of about 3 cm. with finely pulverized charcoal (animal charcoal), and pour upon it 20 to 40 c. cm. of the urine to be tested. Refilter the filtrate until it runs through clear and colorless; this with light-colored urines is usually accomplished in 2 filtrations, while darker urines require 3 or 4. When the urine has all filtered through, wash the residuum in the funnel with distilled water, collecting and keeping the washings separate from the filtered urine. Test the filtrates separately with Fehling's solution. The charcoal treatment removes the coloring matter, uric acid and other substances which interfere and are apt to prevent the precipitation and separation of the red oxide of copper. With urines containing 0.1 to 0.5 per cent. of sugar, the clear filtrate, treated with Fehling's solution and heated, produces an immediate and dense yellow turbidity before the liquid begins to boil. The first washing reacts about the same, while the third and fourth washings usually give a red precipitate of cuprous oxide. When the quantity of sugar amounts to only 0.05 to 0.1 per cent., the filtrate treated as above usually does not cause an immediate separation during the heating, but only after it has boiled for one half to one minute. With very small quantities of sugar the reaction may only set in after 10 to 15 minutes. Urines containing a large excess of urates should be strongly acidulated with hydrochloric acid, set aside for 24 hours, then filtered and treated as above.—Pharm. Centralh., 1892, 730 (also, 1893, 164).

——— *Detection and Determination.*—Salkowski and Jastrowitz have detected a new kind of sugar in the urine of a votary of morphine. With soda-lye and copper sulphate the urine gave a tardy but abundant precipitate of cuprous oxide, but the fermentation test and polarization gave negative results.—Abstract in Zeitschr. f. anal. Chem., 1892, 724.

——— *Determination of.*—E. Laves recommends phenylhydrazin, and for the quantitative estimation of sugar gives the following: To 40 C.c. of urine are added 5 C.c. of a saturated filtered solution of equal volumes of phenylhydrazin hydrochlorate, and sodium acetate, and heated upon a water-bath for 2 hours, whereby the fluid portion is nearly evaporated; the residue is digested with 40 C.c. of alcohol, which dissolves the glucosazon, and 30 C.c. are filtered off. The undissolved glucosazon is placed upon a weighed filter, washed with water, dried at 100° C., and weighed.—Pharm. Post, 1892, 743; from Arch. der Pharm., 1893, 366.

——— *Phenylhydrazin Test for.*—Frank, in Berl. klin. Wochenschr., 1893, 255.—Pharm. Centralh., 1893, 263.

——— *Qualitative Tests for.*—J. D. Riker considers the copper reduction tests, Böttger's bismuth test, Moore's or Heller's test, Mulder's, or indigo carmine test, fermentation test, safranine test, picric acid test, phenylhydrazin test, diazo-benzol sulphuric acid test, Ruber's test, and the

polariscope test. Formulæ for standard and various tests, with the complete bibliography relating thereto.—Med. and Surg. Rep.; West. Drug., 1892, 405; Drug. Circ., 1893. 5–7.

Sugar—Areometer for the Qualitative Estimation of.—A patented apparatus by J. Schütz.—Pharm. Zeit., 1892, 415.

Sugar Estimation in Urine—Source of Error in Polarimetrical, after the introduction of Benzosol.—A. Jolles.—Pharm. Post, 1893, 115.

Sugar and Carbohydrates in Urine.—Jastrowitz.—The urine of the dog, horse and rabbit are found to contain carbohydrates and are in a slight degree lævo-rotatory.—Deutsch Med. Wocheschr.; Zeitschr. für anal. Chem., xxx, Part 6.

Urine—Two Practical Suggestions for Analysts of.—L. F. Bishop suggests a specimen glass and a method for estimating the quantity of sugar in urine.—N. Y. Med. Jour., Drug. Circ., 1892, 273.

Sulphuric Acid in Urine—Volumetric Estimation of.—E. Freund. To 50 C.c. of urine (which must not be too strongly colored) are added 10 drops of a one per cent. solution of sodium alizarinsulphonate, and then a 5 per cent. solution of acetic acid is added drop by drop, until the solution becomes orange colored; 5 C.c. more of acetic acid are now added, the solution heated nearly to boiling, and titrated with barium acetate until the precipitated barium sulphate appears distinctly red. The barium acetate solution contains 11.22 grams per liter. The experimental error amounts to about 2.5 per cent.

Very concentrated urines are diluted before titration. Strongly colored urines should be decolorized by the addition of zinc dust, and the dissolved zinc precipitated by means of sodium hydroxide.—Chem. Centralb., 1892, 607.

Urea—Estimation of.—2.5 C.c. urine are mixed in a stoppered flask with 2.5 C.c. of a solution containing 50 Gm. barium hydrate and 350 Gm. barium chloride in a liter, 75 C.c. of a mixture of 1 volume ether and 2 volumes alcohol (90 per cent.) added, agitated, and set aside until the next day. It is then filtered into a porcelain capsule, the precipitate washed with 50 C.c. of the ether-alcohol mixture, and the ether-alcohol evaporated on a water-bath at 50–60° C. until about 20 C.c. remain. (Should the urine show a high specific gravity, about half a gram of magnesium oxide must be added during this evaporation.) 10 C.c. concentrated sulphuric acid are next added, and the water-bath raised to 100° C.; after the liquid ceases to evaporate it is transferred and rinsed into a Kjeldahl flask, and this heated upon wire gauze until perfect solution has taken place (which requires several hours). After adding an excess of sodium hydrate the ammonia is distilled, collected, titrated, and calculated to nitrogen, which, multiplied by 2.14, gives the urea present in the urine.

This method of Mörner and Sjöqvist, somewhat altered by E. Bödtker,

depends upon the precipitation of all nitrogenous substances except urea and a little free ammonia; during the evaporation the latter escapes (liberated by the $Ba(OH)_2$, or later by the MgO); by the heating with sulphuric acid urea is decomposed, all of the nitrogen going to form ammonium sulphate; the latter is then decomposed by the sodium hydrate, the ammonia collected, titrated, and the results calculated from this.—Ztschr. f. physiol. Chemie, 1892, 140; Am. Jour. Pharm., 1892, 614.

Urea—Estimation of.—W. Colquhoun has devised an arrangement for the estimation of urea. For description of apparatus and results of labor, the original paper must be consulted in Chem. News, 1893, 123.

Uric Acid in Urine—Volumetric Determination.—E. Deroide. The compound of uric acid and of silver has a constant composition, and if we eliminate the xanthic compounds the Haycraft–Herrmann process will be preferable to all others.—Bull. Soc. Chim. de Paris, Series III., No. 12, 1892.

——— *by the Haycraft–Herrmann Method—Estimation of.*—The high results, according to Deroide, are due to the simultaneous precipitation of silver compounds of the xanthic group, insoluble in ammonia.—Bull. Soc. Chim., vii., 363; Jour. Chem. Soc., 1893, 101.

——— *by Means of Saturation with Ammonium Chloride.*—F. G. Hopkins, in Chem. News, 1892, 106; Guy's Hospital Reports, 1892, 299; Zeitschr. f. anal. Chem., 1893, 266. To 100 C.c. of urine add an excess of powdered ammonium chloride (about 30 Gm.). Allow solution to stand for two hours, with occasional stirring. Filter off the precipitate through thin filter paper. Wash the precipitate with saturated solution of chloride of ammonium; or, if a small quantity of crystals of ammonium chloride remain undissolved in bottom of solution, a very small quantity of water repeatedly run through the collected precipitate in the filter will dissolve them out. This washing can be used, with the saturated solution above mentioned, for washing the precipitate.

Into a small beaker wash the precipitate collected on filter by means of hot water from a spritz bottle. The ammonium urate (constituting the precipitate) is then decomposed by HCl, the solution concentrated, if necessary, and the uric acid allowed to separate out. The crystals may be collected on a tared filter, and weighed in the usual way for such determinations, or the crystals may be washed from the filter into a glass basin, in which evaporate off the liquid in a water-bath, and, when dry, heat residue in a hot-air oven at 100° C. till weight is constant, and weigh.

A volumetric determination may be made as follows: Dissolve the uric acid thus obtained by warming with a minimum of Na_2Co_3. The solution, cooled to 15° C., is made up to a 100 C.c., transferred to a flask, rapidly mixed with 20 C.c. of H_2So_4, and then *immediately* tritated with $\frac{1}{10}$ permanganate potassium solution. The end point of the reaction is marked

by the first appearance of a permanent pink flush. On standing, the color continues to disappear, but this slow discoloration is in marked contrast with the instantaneous nature of the first reaction. 1 C.c. of $\frac{1}{10}$ normal permanganate solution=0.00375 uric acid.

Uric Acid—Estimation.—Geelmuyden has sought to employ the precipitation of uric acid by barium chloride, and has obtained promising results, but is obliged to discontinue the investigation without bringing the method to perfection.—Zeitschr. f. anal. Chem., xxxi, 158.

Uric Acid in Mammals—Formation of.—"Uric acid is a product of metabolism occurring within the living cells of mammals, in the formation of which the nuclein of the cell-nuclei is especially concerned."—F. Mares. Abstract, Jour. Chem. Soc., 1892, 1257.

Uroerythrin and Hæmatoporphyrin in Urine.—Zoja. Abstract, Jour. Chem. Soc., 1893, 178.

Urine—Viscosity of.—Rép. de Pharm., 1893, 270.

Xanthine Substances in Urine.—G. Salamon. With an excess of soda-lye, hypoxanthine, xanthine and guanine form readily soluble compounds, whilst para- and heteroxanthine yield compounds readily soluble in an excess of the precipitant.—Arch. Path. Anat.; Zeitschr. f. Anal. Chem., xxx, Part 6.

Urine—Electrical Examination of.—Dawson Turner proposes to determine clinical characteristics of urine by measuring the electrical resistance of that fluid in a V-shaped tube that is connected with a measuring bridge. He determines the resistance of solutions of urea, sodium chloride, grape sugar, etc., and with these as a basis deduces—to him—satisfactory information regarding urine having a resistance of a various number of ohms.—Brit. Med. Jour., Drug. Circ., 1892, 202.

Ehrlich's Urine Test for Typhoid Fever—The Value of.—By G. M. Beringer. From a large number of careful and interesting experiments, the author questions the claims that have been put forth for the value of this test. While the absence of the reaction may indicate the absence of typhoid, the presence of the reaction would not warrant the diagnosis of typhoid unless supported by other evidence, as many of the products producing the reaction, notably phenol and peptone, may be present in the urine from other causes.—Am. Jour. Pharm., 1892, 559–561.

Ehrlich's Diazo-Reaction.—A contribution by C. O. Curtman, demonstrating the usefulness of this reaction.—Pharm. Rund., 1892, 278.

Urine after taking Analgen—Examination of.—Pharm. Centralh., 1893, 56.

Sulphonal.—Large doses of sulphonal do not influence the excretion of urinary nitrogen. There is also no effect on the sulphuric acid.—W. J. Smith. Abstract, Jour. Chem. Soc., 1892, 1507.

Urine during Diarrhœa—Sulphates and Ethereal Hydrogen Sulphates in the.—Bartoschewitsch.—Abstract, Jour. Chem. Soc., 1892, 1505.

BACTERIOLOGY.

Bacteriology for Pharmacists.—An account of necessary apparatus, fully illustrated and with practical work.—Phar. Jour. Trans., 1893, 565, 865.

Bacteriological Chemistry.—A. Kwisda.—Zeits. Oest. Apoth. Ver., 1892, 577.

——— A synopsis of the work that has been done in bacteriological chemistry.—Boston Med. and Surg. Reporter; Phar. Jour. and Trans., 1892, 305.

Bacteriology—Address on.—By G. Sims Woodhead.—(Brit. Med. Assoc.); Phar. Jour. and Trans., 1892, 319; 334–340.

Bacteria—Structure of.—Zettnow shows that the chromatin portion usually seen where bacteria are stained by the ordinary methods is the nucleus with its sheath.—Centr. f. Bakt. u. Parasit., Agric. Science, VI., 384; Phar. Jour. and Trans., 1892, 266.

Bacteria—Variability of.—J. G. Adami states that the conception of species should not be too strict, since considerable variation in the properties of any one species may be frequently manifested.—(Brit. Med. Assoc.), Phar. Jour. and Trans., 1892, 184.

Bacteria—Qualitative test for, in water, by means of hydrogen peroxide.—Gottstein, in Pharm. Jour. Trans., 1893, 4.

Bacteria—Smith's Test for.—T. Smith, of Washington, differentiates bacteria by growing them in a solution containing 2 per cent. glucose, 1 per cent. peptone, 0.5 per cent. common salt.—Boston Med. and Drug. Journ., cxxvii, 206.

Separation of Micro-organisms—Use of Centrifugal in the.—Lezé. Abstract in Rép. de Pharm., 1893, 68., from Compt. rend., Dec., 1892.

Pathogenic Bacilli—Detection of.—K. Ilkewitsch detects tubercle bacilli in milk by coagulating the suspected sample with citric acid, removing the whey, and dissolving the casein (in which bacilli would be enclosed if present) in sodium phosphate solution. By agitating this solution with ether, the action of fat globules upon the bacilli is counteracted. After evaporation of the ether, the mixture is submitted to a centrifugal process (3,600 revolutions per minute) in a kind of lacto-krit. At the end of fifteen minutes most of the bacilli in the coagulum sink to the bottom of the apparatus; and the sediment, being removed, may be stained by the Ziehl method and examined microscopically. By this means, it is stated, the bacilli were detected when no results could be obtained by the method of infection. Finkelburg, also, has succeeded in proving the presence of Eberth's bacillus in water, by using the precipitate obtained in the sedi-

mentary apparatus, when direct demonstration by plate cultures failed.—Münch. Med. Wochen.; Chem. News, 1892, 37.

New Multiple Staining Fluid.—P. G. Unna, in Pharm. Jour. Trans., 1893, 889; Sheff. Med. Jour., 1893, 177. The author differentiates bacilli in tissues by a polychromic methylene blue solution, which contains methylene red and violet, in addition to the blue. The sections are transferred from alcohol and allowed to remain in the stain for at least ten minutes. They are then passed through water into 33 per cent. tannic acid solution to decolorize, allowed to remain from two to five minutes, then rinsed with water to enable the exact tint to be observed more readily. If satisfactory, after a thorough washing with water the sections are placed in absolute alcohol, or a solution of gold orange in the same if a yellow counter-stain be desired, cleared in oil of bergamot, and mounted in balsam. If the excess of stain is not readily removed, a few minutes' immersion in 25 per cent. nitric acid, followed by dilute spirit, water, and absolute alcohol respectively, will effect its removal. By adopting this method it is said to be possible to distinguish two kinds of nuclei (violet and blue), the fibrin, and the protoplasm of the plasma-cells. The bacilli stain red while the mucus surrounding them is blue, and the organisms are said to appear in their natural character "in fish-roe-like masses of vegetable mucus." It is claimed that the process is particularly suitable for use in the study of leprosy. It appears to depend upon the property, also utilized by Nicolle, by which tannin converts methylene blue into an insoluble form.

Microbes which do not Stain by Gram's Method—Detecting.—Nicolle in Ann. de l'Inst. Pasteur; Drug. Circ., 1892, 131. The method of procedure is as follows: The sections are hardened in alcohol, and stained for two or three minutes in Loeffler's or Kuhne's blue; they are then washed in water, after which they are passed through a 1 to 10 solution of tannin, the action of which is almost instantaneous; the sections are then washed again in water, dehydrated, cleared in oil of cloves or bergamot, and mounted in xylol-balsam. A greater contrast can be obtained between microbes and tissues if the sections, after being stained, are slightly decolorized by immersion in a feebly acid water. The histological elements are thereby more decolorized than the bacteria. In this manner the author has succeeded in obtaining excellent results in sections of glanders, typhoid, hog cholera, chicken cholera, soft chancre, etc.

Staining Bacteria in Fatty Substances.—A writer in Centralb. f. Bact. u. Parasit. gives the following: Mix the milk with an equal quantity of distilled water on the cover-glass, dry and fix by a gentle heat. Then stain in chloroform containing methylene blue, made by adding from 12 to 15 drops of saturated alcoholic solution of methylin blue to 3 or 4 C.c. of chloroform. Leave the cover-glass in this solution five or six minutes, withdraw,

evaporate off the chloroform, and wash with distilled water. Examine in water. In fresh milk and cream the bacteria only are stained, but, if curdled, the flakes of casein are dyed a pale blue. This does not, however, interfere with the distinctness of the bacteria, which are stained deep blue.

The Influence of Light on Bacteria has been the subject of an extended series of interesting experiments by Buchner and Minck (Centralb. f. Bacteriol. u. Parasitenk.), and they again prove that light is one of the best exterminators of our unseen enemies. Exposure to direct sunlight for a single hour was sufficient to kill off any cholera vibrios, typhus bacilli, pus cocci, etc., while darkness favors their development. Partially covering the sides of a vial containing solid agar cultures with an opaque body, and then exposing to sunlight, the microbes would multiply in those spots where light could not penetrate, while otherwise the cultures were quickly destroyed. This effect was found to be strongest in the superior violet portion of the spectrum and diminishing towards the inferior red end. Heat was proven not to be a factor in these observations. From this should be drawn the lesson that window curtains and shades should be banished from our living apartments to the greatest possible extent, since there are no more effective and economical disinfectants than sunlight and air. This beneficial influence of light must also be taken into account in the self-purification of running waters.—West. Drug., 1893, 21.

Nuclear Fission in Bacteria receives support from the investigations of Trambusti and Galeotti (Cent. f. Bakt.), who have separated from drinking-water an organism which shows certain structural details indicating real nuclear fission. The preparations included bacillary and oval forms stained with an alcoholic solution of safranin. The bacilli at first stained deeply and regularly, but the external portion afterwards appeared paler. Chromophilous granules were next seen, which eventually formed oval rings joined in moniliform fashion. Later, the oval elements were separated and set free, after which they gradually assumed a cylindrical form, thus completing a cycle in which the bacillary and oval forms represent distinct changes.—Ibid.

Bacteria and Infusoria.—D. H. Attfield.—Brit. Med. Jour., 1694, 1262; Pharm. Jour. Trans., 1893, 4.

Fixation Apparatus for Culture Dishes and Culture Plates.—J. Schrank. Zeits. Oest. Apoth. Ver., 1892, 694.

Bacteriological Culture Apparatus.—W. H. Symons.—Pharm. Jour. Trans., 1893, 1025.

Sterilization Apparatus for a Pharmaceutical Laboratory.—Pharm. Centralh., 1892, 475.

Bacteria upon Acid Media.—Schlüte (Medical Standard) states that very many bacteria grow (some of them very well) upon media with a

distinctly acid reaction. Amongst these are the various forms of staphylococcus, Friedländer's bacillus, and the bacilli of chicken cholera, typhoid and anthrax. Out of a number (thirteen) of pathogenic and saprophytic organisms experimented with, the streptococcus of erysipelas was the only one which would not grow upon any of the acid media employed. Lactic, acetic and hydrochloric were amongst the acids used; one of these was added to ordinary nutrient gelatin. Beyond a certain limit of acidity—which varies much for different bacteria—growth will not proceed.—West. Drug.

Micro-organisms of the Soil.—By A. Springer. The Presidential address before the chemistry section of the American Association for Advancement of Science, Aug., 1892.—Phar. Jour. and Trans., 1892, 278–280; 299.

Bacteriological Analysis of Water.—M. Miquel.—Phar. Jour. Trans., 1892, 481; adapted from L'Union Pharm.

——— Max Dahmen.—Chem. News, 1892, 13, from Chem. Zeit.

——— V. C. Vaughan.—Am. Jour. Med. Sci., 1892, 167–198.

Biological Examination of Water.—E. J. Pany.—Chem. and Drug. 1892, 364. J. A. Wanklyn criticises Mr. Pany.—Ibid., 380. Reply, Ibid., 412.

Sanitary Investigation of a River—Method of Making.—C. C. Brown.—Science, 1893, 284.

Bacillus Pluviatilis.—Dr. A. B. Griffiths describes a new bacillus, found in rain water, preserved during a mild winter in a barrel exposed to the air.—Bull. de la Soc. Chim. de Paris; Chem. News, 1704, 40; Phar. Jour. and Trans., 1892, 82.

Bacteria in Mineral Water.—D. P. Seidler found the artificial waters, as a rule, to contain as many bacteria as the natural.—Amer. Drug., 1893, 148.

Microbes of the Danube Water.—Dr. Heider has found in water taken from the Vienna-Danube Canal, two species of vibrio-like bacilli, resembling in appearance the comma bacillus, to which have been attributed the effects of cholera.—Lancet, 3613, 1252.

A Question of Water, Ethics and Bacteria.—A. R. Leeds.—Am. Jour. Med. Sci., 1893, 259.

Self-Purification of Sewage.—The editor of the "National Druggist" has been engaged in the bacteriological analysis of sewage, and notes the remarkable rapidity with which purification of the fluid is effected by the operation of gravity during rest.

Bacteria in the Dairy.—H. W. Conn.—5th Ann. Rep. Storr's School Agric. Exper. Sta., 106.

Microbicidic Action of Carbonic Acid in Milk.—C. S. Nourry and C. Michel (Ac. d. Sc. cxv., 1892, 959) state that it appears that carbonic acid

has no microbicidic action in the true sense of the word, but that it simply stops the further growth of these organisms.—Jour. Pharm. Chim., 1893, 163; Am. Drug., 1893, 177.

Detection of Bacteria in Milk.—See Pathogenic Bacilli.

Cholera Bacillus—The Chemistry of the.—M. Ferran thinks that as a remedy for cholera it would be reasonable to administer lactic acid in the form of lemonade, and to assist it by the anexosmotic power that is offered by morphine, which might probably prevent the absorption of toxines and prolong the influence of the lactic acid by reducing the rapidity of its elimination.—Compt. Rend., cxv, 361; Pharm. Jour. and Trans., 1892, 181.

——— *A Chemical Function of.*—Chem. Zeit., 1892, 265. If cholera bacilli are cultivated in a weak alkaline bouillon, to which sugar of milk has been added, paralactic acid will be formed in sufficient quantity to give it an acid reaction. Cholera bacilli will live for three years if cultivated on a small amount of alkaline bouillon contained in a small flask, providing the latter be closed with a plug of cotton that admits of slow change of air. Under the same circumstances, by the addition of a little sugar of milk, the bacilli die rapidly, owing to the formation of lactic acid. From these observations we may eventually arrive at conclusions that will prove of value in the treatment of cholera.

Cholera-culture Reaction.—If to a cholera-culture in gelatin or beef-tea a small quantity of concentrated sulphuric acid be added, a red coloration appears, frequently called the cholera-red reaction. A study of the conditions of the reaction shows it to be due to the action of indol upon nitrous acid, produced by the reducing action of the comma-bacillus from nitrates present in the nourishing medium. A series of experiments proves that this cholera test is superior to other known tests for nitrous acid (diphenylamine, sulphanilic acid and naphthylamine, and potassium iodide, starch and hydrochloric acid). The red color with the cholera-culture is interfered with by an excess of pepton, the presence of 2 per cent. pepton completely preventing the coloration, but upon the addition of a little nitrite it becomes apparent. The larger the quantity of the indol present the deeper red the color, small quantities of nitrite answering as well as larger quantities. As a test for nitrous acid in the presence of considerable organic matter, indol in the presence of sulphuric acid forms the most delicate test.—M. W. Beyerinck (Centralbl. f. Bakt., etc.), Apotheker Ztg., 1892, 666.

Identity of the Bacillus Coli Communis and Bacillus Typhi Abdominalis.—Rodet and Roux.—Arch. de Méd. Expér., 1892, No. 3; Am. Jour. Med. Sci., 1892, 347.

Bacillus Coli Communis—Conditions Affecting the Virulence of.—Lesage and Macaigne.—Arch. de Méd. Expér., 1892, No. 3; Am. Jour. Med. Sci., 1892, 348.

Cholera—Pettenkofer's View of.—Pharm. Rund., 1893, 23; from Pharm. Zeit., 1892, 719.

Anticholerin of Klebs.—Professor Klebs, reasoning that every organism during its life-time produced substances which, if allowed to accumulate, would result in the death of such organism (in the case of man and animals these products are carbonic oxide, bile, urine, etc.), has realized success in the treatment of tuberculosis by a preparation, "tuberculocidin," made from the cultures of the bacillus tuberculosis (Proc., 1892, 1087); the failure of Koch's tuberculin is explainable by the presence of products which have specific toxic action upon man along with the products which are destructive to the bacilli; by removing the former substances (called alkaloids) a preparation is obtained not injurious to man, but fatal to the bacilli. Anticholerin is a preparation in which these reasonings are applied in the purification of an extract from the culture of the comma bacillus, and which has given very encouraging results in the treatment of cholera in a Hamburg hospital; while only the most serious cases were treated with it, the number of fatal cases was 16–17 per cent. less than was the case with other treatment. The preparation is a clear, brown-yellow, viscid liquid, having an odor reminding one of cholera patients; it is injected into the muscular tissue of the stomach, or into the subcutaneous tissue of the thigh.—Dr. Manchot (D. Med. Wochenschr.) Pharm. Ztg., 1892, 719.

Disinfection in Cholera Epidemics.—In a proclamation relative to cholera issued by the Prussian Government (Deutsche Vierteljahreschrift für öffentliche Gesundheitspflege, xxiv, p. 554) the following disinfectants are to be used:

1. Milk of lime (one part of lime to four of water). This is to be kept in a well-covered vessel and stirred up before being used.

2. Chloride of lime, freshly prepared and well kept. Evidence of its good quality is its strong peculiar smell. It can be used in powder form, or in solution of two parts in one hundred of cold water. The latter should be allowed to settle and the clear supernatant fluid poured out.

3. Three per cent. solution of potash soap.

4. Solution of carbolic acid. The crude acid is not suitable. The so-called hundred per cent. acid is a convenient form, and is quite as efficient as the pure acid. One part is added with constant stirring to twenty parts of hot three per cent. solution of potash soap. If the pure acid is used, it may be dissolved in simple water.

5. Steam under pressure of not less than a tenth of an atmosphere.

6. Boiling water. The articles to be disinfected to be boiled at least a half hour, the water to be boiled constantly, and the articles completely covered.

Then follow directions for the use of the disinfectants.—Am. Jour. Med. Sci., 1893, 233. (See West. Drug., 1892, 331; Pharm. Centralh., 1892, No. 4.)

Disinfection in Cholera Epidemics.—Advice of the College of Physicians in London.—Pharm. Post, 1893, 322.

"Avoid the use of strong aperients, and especially of strong saline aperients. If there is obstinate constipation, take, at bedtime, either a teaspoonful of Gregory's powder, or one or two teaspoonfuls of castor oil.

"If looseness of the bowels should set in, send immediately for medical assistance, but, if not immediately available, take, as soon as possible, in capsules, or in hot milk, or in any other manner preferred, two teaspoonfuls of castor oil. If, when the action of the oil may be fairly supposed to have ceased, the looseness increases to a watery diarrhœa, and carefully inject into the bowels a quart or more of hot water containing 2 drams of benzoate of soda or 30 grains of tannin. Furthermore, if there be much pain in the bowels, 15 to 30 drops of laudanum may be added to the injection. The injection should be retained as long as it is comfortable to the patient, and it may be repeated once or twice daily during the continuance of the diarrhœa, and until medical assistance has been procured.

"After the administration of the injection, if one has been found necessary, the following mixture should be taken at intervals of from three to four hours, according to the urgency of the symptoms:

Mist. cretæ aromat.	1	oz.
Tinct. camph. comp.	½	dr.
Tinct. chlorofor. comp.	20	drops.
Sp. ammon. arom.	20	drops.
Cerii et bismuthi salicyl.	5	grs.
Sp. menthæ pip.	10	drops.

Fiat dosis 1.

"Should this mixture disagree, or in twenty-four hours fail to give relief, the mixture following should be substituted, and taken every three or four hours:

Acid. sulph. arom.	15	drops.
Tinct. camph. comp.	½	dr.
Tinct. chlorofor. comp.	20	drops.
Tinct. coto.	20	drops.
Syrupi aurant. flor.	1	dr.
Aq. menthæ pip. ad.	1	oz.

Fiat dosis 1."

Cholera: Its origin, diffusion, nature, prevention, and treatment.—Amer. Drug., 1892, 43.

Cholera Bacilli.—A contribution by Jos. Schrank.—Zeits. Oest. Apoth. Ver., 1892, 725, 749.

Haffkine's Method of Protective Inoculation Against Cholera.—E. H. Hankin describes his own experience and the method employed by Haffkine in the production of the vaccine.—West. Drug., 1892, 450.

Cholera—Therapy of.—Dujardin-Beaumetz.—Pharm. Post, 1892, 918.

——— *Treatment of.*—H. Manbach, in Pharm. Zeit., 1892, 599.—Pharm. Rund., 1892, 262.

——— *Ammonium Chloride in the Treatment of.*—M. Dumontpallier, in the name of M. Marotte (Rev. de Thér., Nov., 1892), mentions the following advantages of the use of this salt in the treatment of cholera: It produces a return of warmth and perspiration, also augments diuresis; one is justified in believing that it shows a way for the elimination of the toxic elements of this disease. The medicament should be prescribed in doses proportionate to the intensity of the disease, and the rapidity of the attacks, in cachets, or in liquid form. In addition to the medicament, a mustard bath is of advantage.—Am. Jour. Pharm., 1893, 77.

——— *Protection Against.*—Pharm. Post, 1892, 1069.

——— *Therapy and Etiology.*—Ibid., 1144.

——— *Part Played by Flies in the Dissemination of.*—J. Sawtschenko.—Centralb. f. Bakt.; Chem. News, 1893, 134.

Cholera—Information relating to.—Pharm. Centralh., 1892, 459, 469, 487, 538, 569, 647; 1893, 110.

——— Pharm. Post, 1892, 1147, 1149, 1303; Zeits. Oest. Apoth. Ver., 1892, 562.

Cholera Notes.—An interview with R. T. Thorne.—Chem. and Drug., 1892, 359–363 (editorial), 368; 391, 461, 471, 478. The College and Cholera (editorial), 517. The Cholera Germ, 733.

The Cholera of 1892 in New York.—Three papers by R. W. Wilcox, H. M. Biggs and E. K. Dunham.—Am. Jour. Med. Sci., 1893, 50–80.

Report on Cholera in Europe and India.—E. O. Shakespeare.—Washington: Government Printing Office, 1890.

The Cholera, the Plague and the Black Death.—Nat. Drug., 1893, 75.

Anti-Cholera Preparations.—Formulæ.—Pharm. Post, 1892, 1008.

Cholera Stools—Disinfection Mixtures for.—Borchow, in Rund., 1893, 286; Am. Drug., 1893, 200.

Thymol—Destructive Action, on the Cholera Microbe.—A. G. Rosenoel finds that thymol kills the bacteria in 5 minutes, even when used in the proportion of 1 to 1,000.—Vratch; Drug. Circ., 1892, 276.

Bacillus of Diphtheria—The Poison of.—M. Guinochet cultivated the diphtheria bacillus in a liquid free from albuminoid matter, and found that the poison could be produced by the bacillus of Loeffler, in the absence of all albuminoid matter. He could not determine whether the product itself was an albuminoid. He concludes, however, that it would be premature as yet to attempt to define the place, as a distinct chemical group, of the specific pathogenic substances elaborated by microbes, and suggests

that they should be for the present designated by the somewhat vague term toxine, which would indicate this chief physiological property, the only one duly ascertained as yet.—Compt. Rend., cxiv, 1296; Phar. Jour. and Trans., 1892, 5.

——— Wernicke.—Pharm. Zeit., No. 103; Pharm. Post, 1893, 8.

The Microbe of Influenza.—Pfeiffer and Beck. A further investigation into the etiology of influenza.—Deutsche Med. Wochenschr., 1892, No. 21; Am. Jour. Med. Sci., 1892, 349.

Bacillus of Influenza.—Resistance of, to Physical and Chemical Agents.—G. Tizzoni, La Rif. Med., 1892, 412 and 424; Am. Jour. Med. Sci., 1892, 716.

A Bacillus in the Blood in Measles.—Canon and Pielicke.—Berl. klin. Wochenschr., 1892, 377; Am. Jour. Med. Sci., 1892, 248.

Detection of Tubercle Bacilli—In Tissues, Sputum, and Milk.—Pharm. Jour. Trans., 1893, 610.

Tubercle Bacilli in Sputum—Detection of.—P. Kaufmann fixes the preparation on the cover-glass in the usual manner, but in a very thin stratum; it is then stained with hot carbolic magenta and then moved up and down for three minutes in water at 98–99°, so that only a faint rosy reflection is visible on the preparation. By this treatment most bacteria are decolorized, whilst the bacilli of tubercle and leprosy resist the decolorizing, at least for a considerably longer time. On microscopic examination the bacilli of tubercle appear dark red on a whitish-gray ground.—Zeitschr. f. anal. Chem., 1892, 719; from Centralb. f. Bakt., 12, 142.

Tubercle Bacilli—Kaufmann's Method for Staining.—F. L. Bishop.—N. Y. Med. Jour.; Drug. Circ., 1893, 136.

Tubercle Bacilli—Staining of, with a Sublimate Solution containing Aniline Colors.—Pewsner and Nastinkow.—Pharm. Post, 1893, 269.

Bacillus Tuberculosis—New Method of Staining.—M. Solles. The tissues are prepared in the usual way for embedding in celloidin (first in alcohol for a few hours, then in absolute alcohol for a few more, then into ether, and finally into colloidin), and sectioned. The sections are stained with the following solution:

Prussian blue	1 Gm.
Oxalic acid	20 Cg.
Distilled water	100 Gm.

Mix, and dissolve. Then dissolve 1 Gm. of gelatin in 100 Gm. of distilled water, and mix the two solutions. This liquid will penetrate and stain the anatomical elements, but does not affect the bacillus.—Nat. Drug., 1892, 7.

——— *Rapid Method of Obtaining Cultures.*—S. Kitasato's (Zeitschr.

f. Hyg. u. Infect., xi., 440,) process consists in taking a portion of recently expectorated morning sputum, or of the contents of the pulmonary cavities, washing it ten times in sterilized water, and making cultures on glycerin agar, or serum. At the end of two weeks the tubercular colonies are isolated without difficulty.

——— E. Pastor (Centralb. f. Bakt., xi, 233,) uses a different process. After washing the sputum he makes cultures on plates with glycerin agar. At the end of three or four days the common microbes, mixed with the microbes of tuberculosis, commence to form their colonies, when, by selecting the part on which no colonies appear, and sowing it with serum, he obtains the tubercular bacilli on from one to four cultures out of ten.

——— The editor of the Nat. Drug. inoculates the sides of a guinea pig with the thick portion of the sputum. Eight or ten days after, the inguinal lymphatic glands begin to swell, and one of them is removed antiseptically and introduced into a small-sized sterilized glass tube, after being divided by three or four incisions. With a glass rod, roughened at one of its extremities, the gland is crushed, and mixed thoroughly with a small quantity of sterilized water. The fluid is aspired with a pipette, and sowed in balloons containing broth and glycerin, while the thicker part is spread on agar or serum, and all the cultures are placed in an incubator at 38° C. (100½° F.). In almost every vial a pure culture commences to develop in from ten to fifteen days. It is easy to understand the rationale of this process. Generally after the inoculation of the guinea pig the incisions heal rapidly, and the common bacilli are destroyed by the tissues or by the lymphatic elements, phagocytes, etc., but the bacillus tuberculosis resists and develops in the glands, where it can be found in a state of pure culture.—Nat. Drug., 1892, 170.

Tuberculous Pus—Chemical Reaction of.—The results of the researches of Legrain and Debraye are based upon the nature of the organic elements of the pus.—Jour. de Pharm. et de Chem., 1892, 213.

Typhoid Bacillus—Differentiation of the.—The potato test, generally used to differentiate the typhoid bacillus from B. coli communis was found by G. W. Fuller to be of no diagnostic value; whilst apparently unfailing tests of the former are the non-coagulation of sterilized milk into which the organism has been introduced, the non-formation or very slight formation of acid under similar circumstances, and the turbidity produced, without evolution of gas, when the bacilli are grown in Smith's solution of glucose, peptone and common salt.—Boston Med. and Surg., Journ., cxxvii, 205; Phar. Jour. and Trans., 1892, 265.

A New Bacillus in the Blood of Typhus-Fever Patients.—T. M. Cheesman.—N. Y. Med. Record, 1892, 716.

Ginger Beer.—M. Ward finds the dregs to contain a new yeast and a new bacterium.—Proc. Roy. Soc.; Zeits. Oest. Apoth. Ver., 1892, 499.

A New Ptomaine.—A. B. Griffiths records the production of a ptomaine when the Micrococcus tetragenus, an organism found in the sputum of consumptives, was cultivated on peptonized gelatine for several days.—Pharm. Jour. Trans., 1893, 344; from Compt. rend., 115, 418.

Ptomaines which Simulate the Reactions of Vegetable Alkaloids.—Editorial, Nat. Drug., 1893, 90.

Alkaloids—Action of, on Leucocytes.—Dr. E. Maurel finds that pilocarpine and atropine when mixed in the proportions of their respective toxicities and added to the blood are not offensive to the leucocytes, as either alone thus proving the poisons to be mutually antidotal.—Bull. de Therap.; Boston Med. Surg. Jour., 127, 147.

Leucocytes—Properties of.—Dr. T. Leber draws attention to the fact that it is possible to demonstrate that leucocytes alone, in the entire absence of micro-organisms, possess the power of softening and dissolving the tissues.—Brit. Med. Journal, 1892, 1643, 1357; Pharm. Jour. and Trans., 1892, 5.

Tyrotoxicon, its Presence in Cheese, Ice Cream and Milk, and its Relations to Cholera Infantum.—V. C. Vaughan.—Jour. of Reconstructives; West. Drug., 1892, 297.

Rennet—The Isolation of, from Bacteria Cultures.—H. W. Conn.—Science, 1892, 253.

Fermentation of Arabinose by Bacilli.—Frankland and J. MacGregor show that the products of the fermentation of arabinose by bacillus ethaceticus are qualitatively the same as those obtained in the fermentation of glycerol by the same organism.—Proc. Chem. Soc., 1892, 114; Pharm. Jour. and Trans., 1892, 83.

A Gas-Generating Bacillus in the Urine of a Case of Cystitis.—Schow in Centralb. f. Bak. u. Par., 12, 745; Am. Jour. Med. Sci., 1893, 325.

Wine and Bacilli.—Pick finds that the addition of wine to water does indeed diminish the risk of infection from the latter during typhoid and cholera epidemics.—Phar. Jour. Trans., 1893, 608.

Micro-Organisms of the Mouth.—By J. H. Lindley.—The Dental Register; Phar. Jour. and Trans., 1892, 268.

Phagocytosis as Concerned in Immunity.—W. A. Evans, in Chicago Acad. of Med. Proc.; Med. Stand.; West. Drug., 1893, 14.

Immunity—The Problem of.—Pharm. Centralh., 1893, 48–51.

Carbolated Vaccines.—Dr. Tamamcheff found that carbolization of the vaccine, while not immunizing its value, reduced its toxic effects at least 3 to 6 times as compared to the living vaccine.—Phar. Jour. Trans., 1892, 445; from Ann. de l'Inst. Pasteur, 6, 714.

Mouse Typhus Bacillus.—F. Loeffler has used the bacillus successfully in the extermination of field mice. The bacillus does not affect man or domestic animals.—Pharm. Centralh., 1892, 252 and 469.

Arrowhead Poison.—An observation by Le Dantec, which seems to completely refute the views heretofore held respecting the equine origin of the bacillus of tetanus.—Pharm. Jour. (Aus.) ; Meyer Bros.' Drug., 1893, 105.

ANTISEPTICS—DISINFECTANTS.

Disinfection Apparatus—A Simple, Transportable.—F. Gillar, in Pharm. Post, 1893, 282.

Electrolytic Disinfectants.—Illustration and description of plant.—West. Drug., 1893, 89.

Antisepsis during Epidemics.—E. Vallin in Rev. d'Hygiène, February, 1892, directs attention to the necessity of frequent and prolonged antiseptic applications to the nasal cavities, the mouth and the throat, where morbific germs would be apt to lodge and multiply. Cinnamon water, anise water or a similar vehicle may be used for this purpose, to which may be added naphthol, salol, phenol or other antiseptic agent, which is not poisonous and does not attack the enamel of the teeth ; for the nose a 3 per cent. solution of boric acid is a good application. To be effective these washes should be applied several times a day.—Amer. Jour. Pharm., 1892, 467.

Aniline Dyes as Antiseptics.—C. Prioux finds that pyoktanin, gentian violet and safranine are excellent antiseptics, and maintains that the violet anilines are the most powerful.—Phar. Jour. Trans., 1893, 344 ; Merck's Bull., 5, 517.

Antiseptic Mixtures.—Christmas and Respant recommend several formulæ to be used in dealing with the bacilli of diphtheria, typhoid fever, etc. A one per cent. aqueous solution of any of the first three is said to be sufficiently powerful to kill the germs in one minute, whilst a 1½ per cent. solution of the fourth is stated to act with fatal effects in 30 seconds.

	(1)	(2)	(3)	(4)
Benzoic acid, gram	1	1	—	—
Phenol, gram	8	8	9	8
Chloride of zinc, gram	1	—	—	—
Oxalic acid, gram	—	1	—	1
Salicylic acid, gram	—	—	1	1
Essence of peppermint, drops	—	—	—	10

(Soc. de Biologie) Mon. de la Pharmacie ; Pharm. Jour. and Trans., 1892, 326.

Antiseptics.—Essential Oils and Particularly Oil of Cinnamon and Cinnamol.—L. Championniere, in Rép. de Pharm., 1893, 259.

Odoriferous Substances—The Antiseptic Value of.—H. De Parville.—Les Annales Pol. et Lit., 1892 ; Gard. Chronicle, 1892, 313 ; Pharm. Record, 1893, 23.

Mercurial Antiseptics.—Miguel in L'Année Méd., Feb. 15, 1893.

Mercury Cyanide.—Am. Therap., 1893, 315.

Rottlerin Antiseptic Pastilles.—Formula in Pharm. Centralh., 1892, 648.

Isometric Benzol and Methan.—Relative Antiseptic Value of Derivatives of.—E. E. Sundvik, Finska läk.-sällsk. handl., Helsingfors, 1892, 34, 710.

Bactericides—Essential Oils as.—M. Oweltschenko, by using specially contrived culture flasks and passing through them air impregnated with the vapors of essential oils, was able to establish the quantity, per litre of air, necessary to exercise a bactericidal action. The oils are classified according to their strength as germicides, thus—Cinnamon, fennel, lavender, cloves, thyme, mint, anise, eucalyptus, turpentine, lemon and rose, the last two being very weak in disinfecting power.—Bact. World, Merck's Bull., V., 15; Phar. Jour. and Trans., 1892, 265.

Alliaceous Vegetables as Bactericides.—West. Drug., 1892, 460.

Value and Progress of Disinfection.—C. Tröthandl.—Pharm. Post, 1892, 938.

Disinfectants at High Temperatures.—Heider.—Archiv. f. Hygiene, xv, 341; Pharm. Jour. Trans., 1893, 5.

Disinfection Products—The Action and Practicableness of.—Zeits. Oest. Apoth. Ver., 1892, 515.

Disinfectants.—Emulsions of Tar Oils, especially Lysol, are considered by Engler and Dieckhoff.—Arch. der Pharm., 1892, 561.

Cresol-Lime.—Recommended by Foder as a cheap and effective disinfectant. One part of lime is treated with 4 parts of water, and 5 parts of crude cresol is added. The resulting liquid is miscible in all proportions with water.—Rund., 1892, 753.

Disinfectants—Analytical Notes on Some Commercial.—H. Leffmann.—Amer. Drug. and Pharm. Record, 1893, 371; from Med. News.

——— F. Lascar.—Amer. Drug. and Pharm. Record, 1893, 350, 360.

——— *and Disinfection.*—D. Bevan.—Science, 1893, 298.

Disinfectant Mixtures.—Formulas for, in Pharm. Post, 1892, 677.

Carbolic Acid and Wood Tar for Disinfecting Purposes.—See under Phenol.

Phenolin or *water-soluble phenolin* constitutes a disinfecting agent made of crude cresols and potassium soap.—Pharm. Centralh., 1892, 698; Am. Jour. Pharm., 1893, 9.

Fluorides as Antiseptics.—S. Backeland describes the application of hydrofluoric acid and soluble fluorides in the manufacture of alcohol. It is found that the presence of those substances effectually prevents the development of the organisms causing the formation of butyric and lactic acids, whilst no ill effect is caused to the alcoholic ferment. The small

quantity of fluoride used also seems to excite the activity of the diastase, and to preserve its power for a longer period than normally. Experiments have shown that the diastase could thus be kept in action during seven days and, at the end of that time, 80 per cent. of the original quantity was still active. Without the use of fluorides, the quantity of active diastase was reduced to 12 per cent. in the same period. A similar effect cannot be produced by any other antiseptics or by mineral acid. A considerable saving of malt is effected, an inferior quality of it may be used with good results, and the liquid finally obtained proves much less acid than usual.—Jour. Amer. Chem. Soc., 14, 212.

Blood Serum—Properties of.—Buchner, in Münch. Med. Wochenschr., through Nature, xlvi., 495.—Pharm. Jour. Trans., 1892, 347.

Boro-Salicylic Acid is prepared by dissolving 12 parts of boric acid and 6 parts of salicylic acid in 1,000 parts of water. It is also an excellent antiseptic in the strength of the solution indicated. This solution may be perfumed, and the liquor used for various purposes of the toilet.—Nat. Drug., 1892, 130.

Corrosive Sublimate as a Disinfectant.—A. C. Abbott concludes that under the most favorable conditions a given quantity of corrosive sublimate can render inert only a certain number of individual micro-organisms. He regards the process as essentially a chemical one, being a direct combination resulting from the action of the dissolved sublimate on the blood plasma of the germs. The disinfecting activity of the salt would appear to depend upon the proportion of albuminous material in the medium containing the bacteria. For this reason, the application of sublimate to wound surfaces is objected to. Since the albumin of the tissues and fluids of the body tends to render the salt inert by combining with it rapidly, it is suggested that those tissues are rendered less able to resist the attacks of bacteria. Though, therefore, corrosive sublimate is a powerful germicide, it may have serious disadvantages as an antiseptic wash or dressing for wounds.—Phar. Jour. Trans., 1892, 444; from Johns Hopkins Hosp. Bull.; Brit. Med. Journal, 1665, 88. (Consult Drug. Circ., 1893, 7.)

Chloroform upon Bacteria—The Action of.—Kirschner in Zeitschr. f. Hygiene, viii, 465; Zeits. Oest. Apoth. Ver., 1892, 499.

Salts of Copper as Disinfectants.—Green, in Zeitschr. f. Hyg. u. Infect. Krankh., 1893, 495; Jour. Pharm. Chim., 1893, 565.

Effect of Acids on Bacteria.—G. Schlüter.—Abst. Jour. Royal Mic. Soc.; Phar. Jour. Trans., 1893, 593.

Vinegar and Sublimate as Germicides.—C. T. McClintock finds that vinegar containing 6.3 to 7 per cent. of acetic acid, inhibited the growth of micro-organisms as much as a solution of sublimate (1 in 1000), and further that several forms of bacteria would withstand the action of the

latter for periods extending from one to forty-one hours. He believes that sublimate preserves and does not destroy the organism.—Phar. Record, 14, 370.

Microbes and Carbonic Acid.—By A. Montefusco. The micro-organisms of anthrax, cholera, and typhoid fever are unaffected by it, though the saprophytic bacteria of drinking water are destroyed. He is of the opinion that carbonic acid waters have a certain and destructive action on microbes, and that to this their hygienic property is due.—Rev. inter d' Igiene, Inter. Med. Mag., i, 664; Phar. Jour. and Trans., 1892, 184 and 608.

Citric Acid for the Sterilization of Water during Epidemics of Cholera.—J. de Christmas recommends the addition of one per cent. of citric acid to the water, which should be kept in porcelain vessels.—La Méd. Mod., 1892, 577; Am. Jour. Med. Sci., 1892, 718.

Microbe-Proof Clothing.—A. M. Moricourt, says the Revue Scientifique, has devised a process which he calls metallization, which is applicable to all textile tissues, and which renders clothing, etc., microbe-proof. The tissues—cotton, linen, silk, or woolen—are immersed in a solution consisting of 4 parts of sulphate of copper and 1 part of sulphuric acid to 1,000 parts of water, and boiled for one hour. The subsequent treatment is the same as in ordinary washing—drying, ironing, etc. The goods may be washed two or three times subsequently without losing their antimicrobic properties.—Nat. Drug., 1892, 195.

Regulations in Times of Plague in Austria (1521).—The Earliest.—I. Schwarz.—Pharm. Post, 1892, 997.

FERMENTS, FERMENTATION.

Recent Contributions to the Chemistry and Bacteriology of the Fermentation Industries.—Percy F. Frankland.—Phar. Jour. Trans., 1893, 654, 753, 775, 814, 855, 873 and 939; from Jour. Soc. of Arts.

Fermentation.—E. Büchner.—Ber. d. Chem. Ges., xxv, 1161.

Fermentation and Putrefaction.—F. G. Novy.—Pharm. Era, 1892, 68.

Vital and Chemical Fermentation.—M. Arthus and A. Huber give the results of a number of comparative experiments on vital fermentations, caused by the development of living organisms, and chemical fermentations which may occur in absolutely sterile media. They state that fluoride of sodium, in the proportion of 1 per cent., instantly and definitely arrests the former, in common with most other vital manifestations, but does not affect chemical ferments. A sharp line of demarcation can thus be drawn between the two groups, and the cause of a fermentation in an organic medium be assigned to vital or disastasic action respectively.—Phar. Jour. Trans., 1892, 443; from Compt. rend., 115, 839.

Fermentation—Influence of Antiseptics on.—E. Biernacki. All anti-

septic agents have the property, under certain conditions, especially in small doses, of increasing alcoholic fermentations. The more powerful the antiseptic properties, the more powerful also is this action. Among benzene derivatives the greater the number of hydroxyl atoms, the weaker is the antiseptic, both as regards its antisepticity and its power in small doses of accelerating the fermentation. A mixture of antiseptics increases antifermentative action. The combination of organic with inorganic compounds is more powerful than a mixture of organic substances.—Pfluger's Archiv., 49, 112; Jour. Chem. Soc., 1893, 32.

Ferments—Action of Cold on.—M. d'Arsonval shows that whilst with an ascending scale of temperatures, micro-organisms are destroyed before soluble ferments, the reverse is the case at low temperatures.—Phar. Jour. Trans., 1893, 607; from Rev. Scient., Bull. de Pharm. de Bordeaux, 32, 338.

Diastase—Chemical Conditions of the Action of.—J. Effront obtains the nitrogenous residue from the manufacture of glucose, and studies the behavior of its constituents with asparagine, aluminum, and phosphoric acid.—Bull. Soc. Chim. de Paris, ix. and x., No. 5. (See also Compt. rend., cxv, 1324).

Fibrin Ferment.—C. A. Pekelharing in Ber. d. Chem. Ges., xxv, 949.

Hydrolytic Ferments.—Hildebrandt.—Abstract, Jour. Chem. Soc., 1893, 329.

A New Soluble Ferment.—Maltase, obtained by E. Bourguelot, a new ferment affecting maltose.—Compt. rend., 116, 826; Phar. Jour. Trans., 1893, 887.

Isolation of Rennet-ferment in Milk.—H. W. Conn.—Phar. Jour. Trans., 1893, 609 and 685; from Centralb. für Bact., 1892, 12 and 223.

Yeast—Hydrolytic Functions of.—J. O'Sullivan.—Jour. Chem. Soc., 1892, 593 and 926. The author finds that the power of yeast to produce alcoholic fermentation is not altered in any way by the yeast having first hydrolyzed the cane sugar.

Ferments—Vegetable.—J. R. Green.—Phar. Jour. Trans., 1893, 946 and 970, etc.; from Annals of Bot., March, 1893.

Ferment of Cherry Gum.—A new ferment discovered by F. Garros.—Phar. Jour. Trans., 1892, 444; from Bull. de la Soc. Chim., 7, 625.

Vegetable Digestive Ferment.—Daccomo and Tommasi have studied the action of Anagallis arvensis, which they find possesses the property of destroying rapidly, and without pain, fleshy growths, and even horny warts. This property is due to a ferment which they have succeeded in isolating. Further details as to possible practical application of the ferment are promised upon the completion of continued researches.—Rev. de Therap., lix, 470; Phar. Jour. and Trans., 1892, 267.

Urostigma Dolarium (N. O. Urticaceæ).—Peckolt has isolated a digestive ferment.—Note in Chem. and Drug., 1893, 437.

PHARMACOGNOSY, MICROSCOPY.

Technique of the Modern Microscopes.—W. Kaiser. A guide to the use of the modern microscope.—Pharm. Post, 1892, 835, etc.

Microscope—The Choice of a.—A. S. Grubb.—Drug. Circ., 1892, 149.

Photomicrography.—F. L. James. A historical account of the process.—Nat. Drug., 1893, 80.

——— Editorial in Bact. World.—Drug. Circ., 1892, 188.

Slides and Cover Glasses, Influence of the Composition of the Glass of, on the Durability of Microscopic Objects.—Weber finds that those glasses which contain an excessive amount of alkali soon lose their lustre and become dim when exposed to moisture.—Ber. d. Chem. Ges., xxv, 2374; Pharm. Centralh., 1892, 501.

Clearing and Mounting Sections.—Pharm. Jour. Trans., 1893, 649.

Microscopic Slides—Notes on a Handy Method for Finishing.—A. C. Stark, in Pharm. Jour. Trans., 1893, 756.

Stains and Staining.—P. W. Squire. Lecture on Stains and Staining as applied in the examination of animal and vegetable structures under the microscope. The following are noted: Nuclear stains; logwood and hæmatoxylin; Delafield's hæmatoxylin; Kleinenberg's hæmatoxylin; Kleinenberg's solution (improved formula); Ehrlich's hæmatoxylin; ammoniated hæmatoxylin (Squire); the color produced by hæmatoxylin; carmine; picrocarmines; ammonia picro-carmine; picro-lithium carmine; aniline nuclear stains; contrast stains; methylene blue; iodine green; cellulose reactions; Schulze's solution; chor-zinc iodide (improved formula); double staining; sieve areas.—Pharm. Jour. Trans., 1893, 645 and 653 (also 763). Reprinted in Drug. Circ., 1893, 126.

Staining Vegetable Tissues.—In Pharm. Jour. and Trans., 1892, 401, will be found an account of the preparation and uses of necessary reagents for histological botanical work.

Staining Methods of Microscopical Preparations—Some Practical.—W. Swiatecki in Centralbl. f. Bacteriol., 1892, 247.—Chem. Zeit. (Chem. Rep.), 1892, 315.

Chloral Carmine.—A new Staining Agent.—A. Meyer.—Pharm. Jour. Trans., 1893, 685; from Ber. d. Chem. Ges., 10, 363. To prepare the solution, heat on a water-bath, for thirty minutes, half a gram of carmine, twenty C.c. of absolute (?) alcohol, thirty drops of hydrochloric acid, and then add twenty-five grams of chloral hydrate, allow it to cool, and filter. This solution stains the nuclei of pollen grains a deep red in ten minutes, and is also useful for the nuclei of pollen tubes grown on gelatin.

Vegetable Tissue for the Microscope—Preparation of.—A. Flatters.—Pharm. Jour. Trans., 1893, 1057. (Illustrated.)

Embedding Medium—A New.—Camille Brunotte describes a new mode of utilizing gelatin as an embedding medium, by which the action of heat upon tissues containing water can be avoided.—Jour. de Bot., 1892, 194; Phar. Jour. Trans., 1892, 42.

Glycerin Jelly for Mounting.—J. E. Huber recommends that clear gelatin (1 drachm) be allowed to macerate in glycerin (1½ oz. by weight) over night, and that the mixture should then be heated in a water-bath until solution is perfect. Specimens to be mounted should be soaked first in dilute, then in stronger glycerin, afterwards placed on a slide with as little dilute glycerin as possible, and covered with hot jelly. After cooling, the cover glass is placed over the object, heat applied to the slide, and the cover pressed down into position when the jelly melts. On cooling over night the slide may be cleaned and finished off. The mounts are stated to be free from the liability to shrinkage that often occurs when glycerin jelly is used.—Phar. Jour. Trans., 1892, 347.

Potassium Permanganate in the Preparation of Fresh Sections.—E. T. Wynne uses permanganate of potash in the place of osmic acid, and finds it more trustworthy for every-day work and more expeditious.—Lancet, Sept., 1892; Phar. Jour. and Trans., 1892, 323.

Gum for Attaching Labels to Slides.—Dissolve 2 Gm. aluminum sulphate in 20 of water, and add to 250 Gm. of strong mucilage (2 of acacia gum to 5 of water). A similar addition may be usefully made when the mucilage is made from dextrine.—Jour. Chem. Soc., 1893.

A. Fromme's Contrivance for Polarization in Histological Work.—V. v. Ebner.—Abstract in Chem. Zeit. (Chem. Rep.), 1892, 379.

Polarization—Rapid.—H. M. Wilder.—Drug. Circ., 1893, 125. (See Proc. 1891, 277).

Notes on a Proposed Adaptation of Biot's Apparatus to the Microscope.—A. C. Stark.—Phar. Jour. Trans., 1893, 756.

Substitute for the Camera Lucida.—H. G. Piffard.—Inter. Jour. of Micros., Jan., 1893; Phar. Jour. Trans., 1893, 626.

The Microscope in Pharmacy.—L. E. Sayre.—New Eng. Drug., June, 1893; Bull. Pharm., 1893, 275.

The Microscope for Pharmacists.—Some ways in which it is of pecuniary advantage to the pharmacist in the examination of drugs, powders, urine, etc.—Brit. and Col. Drug.; Meyer Bros'. Drug., 1892, 302.

Pharmaceutical Microscopy—Notes on.—This article treats of the following subjects, some of which are incorporated into this report: 1. Detection of croton and castor oil seeds. 2. Experiments in germination of seeds. 3. New forms of bacteria. 4. Making leaves and flowers trans-

parent. 5. Development of Osmunda. 6. A new embedding medium. 7. Embedding and section cutting.—Phar. Jour. Trans., 1892, 41.

Pharmacognosy—The Study of.—A convenient arrangement of drugs for practical study.—Pharm. Post, 1893, 194.

Progress in Pharmacognosy—Quarterly Report on the.—H. Lafite, in Pharm. Post, 1892, 809 and 831, etc., reviews the work on Argemone mexicana, Kamala, Spiræa ulmaria, commercial Geoffrya and Andira barks, cultivation of medicinal plants in Japan, Cephaelis ipecanuanha, Acacia digyna, Dioclea violacea, a new elemi resin, suffed baham, mace, Derris elliptica (the Malay fish poison, "aker-tuba"), Garcinia indica.

Beeswax—Micro-chemical Test for.—Make a solution of the suspected wax in chloroform, and let a drop of it fall on a slip. As soon as a pellicle begins to form let a cover-glass fall on it, but do not press down, at least hot heavily. Put in a cool place and let stand. In the course of from twenty to thirty minutes you may examine it, using a one-fifth objective and two-inch eye piece, and if the wax is free from mineral fats, or from fatty acids, you will observe tufts of feathery crystals form in such manner that each group assumes the shape of dumb-bells, or double balls of crystals, radiating from a common center in each ball. These balls vary from 25 to 50 microns ($\frac{1}{1250}$ to $\frac{1}{625}$ inch) in diameter, according to the rapidity of evaporation of the solvent. The crystals are the same for yellow or white wax, and in pure wax no other shapes are seen. If animal, vegetable, or mineral fats are present, the wax crystals will be seen intermingled with the characteristic crystals of the adulterating fats. The observation can be made without the use of the polariscope, but the latter renders the detection of foreign fats much easier.—Nat. Drug., 1893, 189.

Cork and Cutin — Micro-chemical Reactions for.—Zimmerman, in Zeitschr. f. wissenschaftl. Mikroskop., 1892, 58.—Chem. Zeit., (Chem. Rep.) 267.

Powdered Drugs—Microscopical Examination.—H. M. Wilder.—Drug. Circ., 1893, 101.

Powdered Official Leaves—Microscopical Characters of.—L. Braemer, in Bull. Soc. de Med. de Toulouse, 1892, 108.

Starch Grains—Comparative Value of the Size of.—E. Hanausek has tabulated his own results, as well as those of others, upon the examination of the starches of ginger, curcuma, zedoary and galangal.—Zeits. Oest. Apoth. Ver., 1893, 179.

Starch—Nature and Occurrence in Root Drugs.—E. S. Bastin contributes a valuable, illustrated and comprehensive article (in Apothecary, Dec., 1892,) upon the starches of Mexican and Honduras sarsaparillas, Peruvian, Savanilla and Texan rhatany, Phytolacca, Pareira, Spanish and Russian licorice, Ipecacuanha, Gelsemium, Calumba, Belladonna, Sumbul, Rheum, Rheum rhaponticum, Rumex crispus, Piper methysticum, Asclepias,

Symphytum, masterwort, Apocynum.—Reprinted, Pharm. Jour. Trans., 1893, 649, 747, 769.

Starch.—In Subterranean Stem Drugs—E. S. Bastin, in Apoth., June, 1893, gives an illustrated account of the following starches: Aspidium, Ginger, Galanga, Calamus, Orris root, Veratrum album and V. viride, Simplocarpus, Cypripedium, Dioscorea, Sanguinaria, Geranium, Podophyllum, Valerian, Serpentaria, Spigelia, Hydrastis, Caulophyllum, Cimicifuga, Menispermum, Leptandra, Jalap, Aconite and Colchicum.

Stem Plants of Some Drugs—Mistaking the.—C. Bauer considers the following: Urginea scilla Steinh. (Scilla maritima Steinh.) with Eucomis punctata Aiton; Atropa Belladonna L. with Scopolia carniolica Jacq. (S. atropoides Schult.); Gentiana lutea L. and G. pannonica scop. with Veratrum album L.; Polygala amara L. with P. amarella crantz; Polygala vulgaris L. with P. comosa Schkuhr.—Zeits. Oest. Apoth. Ver., 1893, 133.

Sulphur—Micro-Chemical Test for.—Emich, in Zeitschr. f. anal. Chem., xxiii, 163. A small amount of the substance in fine powder is placed on a microscope slide, moistened with a drop of $CaCl_2$ solution (3 to 25 per cent.), and then subjected to the influence of Br vapors. If S or a sulphide is present, $CaSO_4$ forms, and the crystals may be readily detected under the microscope. A long list of substances (59), chiefly minerals, but also including ultramarine, $Na_2S_2O_3$, mustard, etc., is given, in which the test was successfully applied.

Tannins—Micro-chemical Tests for.—A comprehensive and valuable review of this subject.—Pharm. Jour. Trans., 1892, 361.

Turmeric—Micro-chemical Tests for.—H. M. Wilder continues to use volatile oils.—Drug. Circ., 1893, 53 and 76.

Forensic Microscopy.—L. A. Harding.—Science, 1892, 242.

The Use of the Microscope, with Preparations and Culture Tests, in Examining Foeces Suspected to Contain Cholera Germs.—A. Weichselbaum.—Pharm. Post, 1892, 897.

Leucocytes—Staining Reactions of.—Wright and Bruce.—Pharm. Jour. Trans., 1893, 808; Brit. Med. Jour., 1678, 400.

Saliva, Blood, etc.—Staining of.—M. Switztecki (Gaz. Lekarska) suggests a new and rapid method for coloring specimens of blood, sputum, etc. He spreads the material in the usual manner, and after it has dried he lays over the whole two or three thicknesses of filter paper, and pours the stain on the surface of the same in sufficient quantity that the paper becomes wet through with it. The wet paper is left in contact with the specimen until the latter is stained. In this manner he avoids the necessity of freshly filtering the stain, and keeps the specimen protected from dust, etc., during staining. It is unnecessary to remark that the paper must be kept scrupulously clean.—Nat. Drug., 1893, 133.

Movements of Microscopic Objects—Analysis of.—M. Marey.—Abstract in Nat. Drug., 1892, 43.

MATERIA MEDICA (VEGETABLE) AND BOTANY.

GENERAL.

Arils and their Origin.—A. Pfeiffer. A classification according to origin.—Phar. Jour. Trans., 1893, 593; Engler Jahrb., 13, 492.

Beer Seed—California.—Notes by C. V. Riley.—Pharm. Era, 1892, 271.

Colza—Cultivation of, in France.—Pharm. Era, 1892, 172.

A New Fibre.—A microscopical examination of the bark of a Brazilian plant the botanical origin of which is unknown.—Chem. Zeit., 1892, 988.

Tokmari Seeds.—The seeds of Lollemantia Rogleana are described by A. Ghose in Ind. Agric.—Chem. and Drug., 1892, 655; Zeits. Oest. Apoth. Ver., 1893, 26.

Tonic Barks—Notes on.—P. L. Simmonds gives a few descriptive notes on some of the tonic barks employed in different countries.—Bull. Pharm., 1893, 110.

Hartwich on "The Discovery of America," and its Bearing on Materia Medica.—F. A. Flückiger.—Schweiz. Wochenschr. f. Chem. u. Pharm.; Drug. Bull., 1893, 40.

——— its Bearing on Pharmacognosy.—Pharm. Centralh., 1892, 525.

Die Systematische Gruppierung der Pflanzen.—H. Hoffman.—A detailed list, with dates of methods of plant classification beginning with the Linnæan classification in 1735 and ending with Engler's in 1892.—Pharm. Record, 1892, 164.

Herbaria—Preservation of Plants in the.—A. Chabert, in Bull. Soc. Bot., France, xiv, 156. The author discusses the various methods used. Among others it is noted that paper manufactured solely of vegetable matter, and unbleached, notably that made of wood fibre, is especially valuable for preventing the ravages of insects, though it is neither as white nor as smooth as might be wished. It is suggested to use alum in the manufacture of herbarium paper as a preventive of insect life. The author concludes, however, that one of the most efficacious, least expensive, and least time-consuming of processes for the complete extermination of herbarium pests is a semi-yearly fumigation with sulphur.

The Drying of Herbs, Flowers and Other Vegetables.—A patented apparatus by G. Christ, of Berlin.—Illustrated and described in Pharm. Post, 1892, 1121.

Herbarium—The Oldest in the World.—Paul Pasig, in Westermann's Monats-Hefte, describes the herbarium in the Egyptological Museum at Cairo.—Nat. Drug., 1892, 91.

The Geographical Distribution of Plants.—W. F. Ganong.—Trans. Mass. Hort. Soc., 1891, 140.

Simple Medicaments—Geographical Distribution of.—G. Planchon considers those of the steppes of Asia.—Jour. Pharm. Chim., 1893, 225.

——— Desert region.—Ibid., 457.

Note on Botanical Collections.—F. von Mueller. An account of the collections of Sir William Macgregor of the vegetation of New Guinea.—Phar. Jour. Trans., 1893, 550.

Variation in Species.—Observations by E. Sickenberger on variations in medicinal plants.—Nat. Science, 1, 560; Phar. Jour. Trans., 1892, 347.

Cultivated Plants—The History of.—Apoth. Zeit., 1892, 72; Pharm. Rund., 1892, 292.

Medicinal Plants—Cultivation of.—An account of a visit by M. Planchon to Milly where medicinal plants are cultivated to a large extent.—Répertoire, 1892, 375; Phar. Jour. and Trans., 1892, 184.

——— F. Truka.—Zeits. Oest. Apoth. Ver., 1893, 157.

——— A. Prikryl.—Ibid., 265. C. Labler, Ibid., 303.

——— Pharm. Post, 1892, 675, 1021; 1893, 93.

Botanical Garden of La Mortola.—E. Strassburger, in Pharm. Rund., 1893, 113.

Botany of Thibet.—Note on exploration by Dr. Thorold.—Chem. and Drug., 1893, 645.

The Rothamsted Experiments.—The nature and extent of the experiments which have been made by Sir John Bennet Lawes.—Phar. Jour. Trans., 1893, 828.

Early Botany and Materia Medica in England.—VI. The Rise of System, Morrison and Ray.—Pharm. Jour. and Trans., 1892, 21–23. VII. The Establishment of the Linnæan System, ibid., 141. VIII. The Rise of Phytomy, ibid., 321. IX. The Rise of Vegetable Physiology—The Sexual Theory, ibid., 1893, 545. X. The Rise of Phytology, ibid., 586. XI. Physic Gardens, ibid., 725. XII. Botany at the Universities, ibid., 825.

Flora Brasiliensis.—Fasciculus cxi., Malvaceæ, Part II. The genera of Malachra, Urera, Pavonia, Gœthia, Malvaviscus, Hibiscus, Kosteletzkya, Cienfugosa and Gossypium are treated.

Vegetable Products of Calabria.—Vice-Consul Kerrich says, with reference to olive oil: "The oils of this province are well known in England, and English houses that do business in this article would gain much by purchasing directly from these places the refined oils and those for table

use. This could be attained by sending in due time their orders here, instead of giving their commissions for branded oils to intermediate markets where these oils are sold for 'provenza' oils." He also considers the production of oranges, lemons and timber in this district.—Pharm. Jour. Trans., 1892, 446; from Gard. Chronicle.

Ceylon Botanic Gardens.—Notes upon a visit to Buitenzorg. On Cubebs, Kola-nut; Calumba and Coca.—Chem. and Drug., 1892, 907.

Primitiæ Floræ Costaricensis.—This comprises the following orders: Piperaceæ, by M. C. De Candolle; Labiatæ, by M. J. Briquet; Melastomaceæ, by M. A. Cogniaux; Cucurbitaceæ, by M. Cogniaux; Araliaceæ, by M. E. Marchal; Leguminosæ, by M. M. Micheli; Polygalaceæ, by M. R. Chodat.—Bull. Soc. Bot. Belg., 30, 196.

Chili—Drugs of.—Bailahuen, Cepacaballo, Natri, Païco, Panul and Te de Burro. A description of the uses.—Pharm. Post, 1892, 943.

Cyprus Productions.—Notes on olive culture, which is neglected; the carob or locust-bean tree; honey, which might be made profitable; sponge fishing, to be farmed out; sumach and colocynth, and other drugs.—Chem. and Drug., 1892, 612.

Jamaica Drug Cultures.—Statistics from report of the Director of the Jamaica Botanical Department.—Chem. and Drug., 1893, 322.

The Guaiacum and Cinnamon Trees of Jamaica.—An account of these two trees as seen in the travels of the author, Allan Eric.—Drug Reporter, June, 27; Phar. Jour. Trans., 1892, 47.

Indian Drugs.—F. Stephenson remarks upon Viburnum fœtidum, Agar-agar, Andrographis paniculata, Weihrauchstöcke, Areca Nuts, Andropogon laniger, Withania coagulans, Holarrhena antidysenterica, Adhatoda vesica.—Pacific Record; Abstract in Pharm. Post, 1893, 194.

——— B. D. Basu. A brief historical sketch based upon the study of the Rig-Veda, works of Charaka and Sashruta, Raja Nighantu, Mandana Pâla Nighantu, Bkâva Prâkasha, and the writings of the European period of Indian History.—Indian Med. Gaz., 1892, 225.

Indian Drug Cultivation.—Notes, on Cinchona and Quinine; Eucalyptus Oil; Fld. Ext. Eucalyptus; Ipecacuanha; Jalap. Taken from the annual report of the Director of Gov. Bot. Gard. in the Nilgiris.—Chem. and Drug., 1893, 92.

Medicinal Plants of India and their Cultivation.—H. Heger.—Pharm. Post, 1892, 652, 673, etc. Cinchona, Cinnamon, Piper nigrum, Piper cubeba, Caryophyllus aromaticus, Caffea Arabica, Elettaria Cardamomum, Myristica fragrans, Melaleuca minor and M. cajuputi, Dammar, Dipterocarpus trinervis, Myroxylon, Styrax Benzoin, Thea chinensis, Theobroma Cacao, Vanilla planifolia, Mallotus philippinensis, Pterocarpus, Bixa Orellana, Uncaria Gambir, Piper Betel, Areca Catechu, Betel.

Oil Trade of Marseilles.—Pharm. Jour. Trans., 1893, 932; from Consular Report, 7, 1182.

Mentone—Natural Products of.—Consular Rep., 1198, 18; Pharm. Jour. Trans., 1893, 994.

Sylva of North America, Volume IV.—Rosaceæ, Saxifragaceæ.—C. S. Sargent.—(4to, pp. 141, illus.)

Some Plants of Medicinal Value found in California.—W. P. Gibbons. Trans. M. Soc. Cal., 1892, 231.

California Plants in Medicine.—F. D. Bullard.—South Cal. Pract., 1892, 486.

Economic Plants of the Missouri Botanical Garden.—H. L. Clarke.—An enumeration of unusual types.—West. Drug., 1892, 445; 1893, 11.

Botanical Features of the Riviera, with Special Reference to Medicinal Plants.—E. M. Holmes.—Pharm. Jour. Trans., 1892, 485.

Sierra Leone—Some Economic Plants of.—Abstract from Colonial Report in Pharm. Jour. Trans., 1893, 1026-1028.

Local Indigenous Plants of Medicinal Interest.—Joseph Crawford. An extended account of the medicinal plants of the Middle Atlantic States. —Am. Jour. Pharm., 1893, 42 and 149.

An Enumeration of South American Plants, Collected by Dr. H. H. Rusby.—A continuation of the articles which have appeared in the Bull. of Torrey Bot. Club.—Bull. Torr. Club, 1892, 263, 371 and 1893, 137.

An Enumeration of the Plants Collected in Bolivia by Miguel Bang.—H. H. Rusby.—Mem. Torr. Bot. Club.

Pflanzenpathologische Mittheilungen aus Ecuador.—G. de Lagerheim.—Zeitschr. Pflanz. Krank., 2, 195.

Novitiæ Peruvianæ.—A. Zahlbruckener. New species from Peru are described in genera Viburnum, Psychotria, Rudgea, Myrsine, Conomorpha, Styrax, Nathusia, Echites, Solanum, Athenæa, Columnea, Amphilophium and Mesophæum.

Straits Settlements—Some Medicinal Products from the.—E. M. Holmes describes the following: Specimen of the ipoh plant (Antiaris toxicaria) from a young tree and from a large tree; ipoh aker (Strychnos sp.); lampong (Strychnos maingayi); gadong (Dioscorea hirsuta); aker tuba (Derris elliptica), Strychnos tieute; Sideroxylon sp.; milor; itah visi and itah tembaga; kulit lawang; and of the plants yielding gutta sundek, gutta garru, gutta taban chaier, gutta taban simpor, gutta taban merah, gutta taban puteh, gutta taban sutra, buah slisis, poko sindarah, poko plang, kulit lawang.—Pharm. Jour. Trans., 1893, 388.

Educational.

The New Botany.—L. F. Ward.—Science, 1893, 43.

Modern Botany.—C. R. Barnes.—Science, 1892, 62.

Current Methods in Botanical Instruction.—Conway Macmillan (pamph., p. 8).

Broader Botany—A Plea for.—L. H. Bailey.—Science, 1892, 48.

Medical Botany.—C. F. Millspaugh.—Science, 1892, 91.

Standard of the Pharmaceutical Profession?—What will Elevate the.—F. J. Wulling.—Pharm. Era, 1893, 487.

Studies in Botany Applicable to Pharmacy and the Pharmacist.—D. M. R. Culbreth.—Pharm. Review, 1892, 132, 151, 166, 192, 207, 228; 1893, 4, 26 and 48.

The Work of a Botanical Laboratory in Pharmaceutical Manufacture.—J. S. Wright.—Science, 1893, 183.

Botany as an Aid to the Pharmacist.—Editorial, Bull. Pharm., 1892, 592.

"*Botany as a Hobby.*"—*Early Spring Plants.*—Henry Kraemer.—Amer. Drug., 1893, 193.

Pharmaceutical Education.—Henry Kraemer.—Science, May 19, 1893; Amer. Drug., 1893, 330.

Anatomy as a Special Department of Botany.—Emily L. Gregory.—Bull. Torr. Club, 1893, 100. Read before Am. Assoc. Adv. of Science.

Two Schools of Plant Physiology as at Present Existing in Germany and England.—Emily L. Gregory.—Am. Nat., vol. 26, 211 and 279.

Nomenclature.

Scientific Nomenclature as Applied to Pharmacy.—Hints towards its understanding by E. L. Marks.—Am. Drug. and Pharm. Record, 1893, 389; from Pharm. Jour. (Aus.)

Botanical Names of Official Drugs.—H. W. Schimpf.—Their derivation and significance.—Pharm. Record, 1892, 213.

Botanical Names of the U. S. Pharmacopœia—A Supplement to the Revision of.—H. H. Rusby.—Bull. Pharm., 1892, 657; see Proc., 1892, 204.

Biological Nomenclature.—C. H. Tyler.—Science, 1892, 164.

International Botanical Congress at Genoa.—E. M. Holmes.—Phar. Jour. Trans., 1892, 509.

The Nomenclature Question at Genoa.—Lucien M. Underwood.—Bull. Torr. Club., 1892, 325.

Dr. Kuntze and his Reviewers.—E. L. Greene.—Pittonia, 2, 263.

The Nomenclature Question.—G. H. French.—Science, 1892, 151.

Botanical Trinomial.—C. Michener.—Science, 1892, 245. Ibid., 1893, 105.

Nomenclature Priority Question—Some Points in the.—L. M. Underwood.—Science, 1892, 116.

Botanical Terminology — Some Suggested Emendations in. — E. M. Holmes.—Pharm. Jour. Trans., 1893, 969.

On Legitimate Authorship of Certain Binomials, with Other Notes on Nomenclature.—Geo. B. Sudworth.—Bull. Torr. Club., 1893, 40.

Nomenclature—Botanical.—Comments on the circular sent out by the committee of German botanists appointed to amend the laws of botanical nomenclature as adopted at the Paris Conference of 1867.—Gar. and For., 5, 362.

——— K. Brandegee.—Zoe, iii, 258.

——— N. L. Britton.—Bot. Gaz., xvii, 252.

——— A. de Candolle.—Zoe, iii, 172 ; from Jour. de Bot., May, 1892.

——— J. M. Coulter.—Science, 1892, 146.

——— G. C. Druce.—Pharm. Jour. Trans., 1893, 925.

——— H. H. Rusby.—Bull. Pharm., 1892, 653.

——— S. Watson.—Bot. Gaz., xvii, 169.

Etymology of the Nomenclature of the U. S. P.—Oldberg.—Apothecary, Dec., 1892.

Synonyms.—Editorial on danger of use of synonyms.—Chem. and Drug., 1893, 542.

Synonyms of Plants of New Spain.—J. Ramerez.—El Estudio, 4, 220.

Insects and Plants.

Insects Injurious to Drugs.—V. L. Kellogg and L. E. Sayre have begun a series of investigations upon the insects injurious to drugs. The paper is illustrated by the following species: Mites, Dermestid Beetle, Ptinus brunneus, Anobium paniceum, Larioderma serricorne, Bostrichus dactiliperda, Ceutorhynchus, Calandra oryzæ, Tinea genus, Angoumois grain moth, Carpocapsa amflana, Myelois ceratomia, Œcophaga oliviella, Dacus oleæ, Trypeta arnicivora.

The destruction of these pests requires considerable knowledge of entomology. We must know the life history, the habits, the place and time when the eggs are laid, how long it remains in the larval stage, the habits of the larva, where the quiet and helpless pupæ are to be found, when the adult appears, and what are its habits. When we understand these points, the rationale of the remedy presumably suggests itself. The usual remedies may be applied. [We hope, however, that the authors will continue these investigations as they have promised.]—Meyer Bros'. Drug., 1892, 234.

Insecticides.—Condensed information concerning some of the more valuable insecticides.—Circ. U. S. Dep. Agric.; West. Drug., 1893, 193; (Also, Pharm. Era, 1893, 388.)

Insecticides.—Collection of formulæ in Pharm. Post, 1892, 842.

——— *Alkaloids as.*—A. Laboulbène (Comp. Rend., xvi, 702; Pharm. Jour. Trans., 1893, 889, calls attention to the fact that alkaloids lose their poisonous properties by undergoing oxidation, and therefore, unlike mineral poisons, eventually become innocuous to human beings when applied as insecticides. He therefore proposes the use of infusions made from drugs containing poisonous alkaloids as a means of protecting plants against larvæ. Repeated experiments have been made with decoctions of the stems and leaves of Delphinium grandiflorum, as well as with the seeds of the same plant, and of D. ajæcis. It is thought, however, that the seeds of D. staphisagria may be more energetic in their action, and aconite, stramonium, belladonna, hyoscyamus, etc., are suggested as furnishing suitable material for experimenting in this direction.

——— *against Phylloxera.*—One is made according to Kuhl (in Apoth. Zeit.; Meyer Bros.' Drug., 1893, 127,) by saponifying any vegetable oil with sulphuric acid, incorporating carbon disulphide and exactly neutralizing with an alkali; this preparation is as efficacious as pure carbon disulphide, and is not volatile and is miscible with water. In contact with water or moist soil, slow decomposition takes place with evolution of SO_2 and mercaptans, which latter increase the effectiveness.

Fungicides and Insecticides—The Use of Poisons as.—L. R. Taft.—Science, 1893, 259.

Bouillie Bordelaise.—This preparation has been proved to be a specific for the potato blight caused in Europe by Phytophthora infestans, and the following formula for its preparation appears in the Kew "Bulletin" for October:

Copper sulphate	45	lbs.
Quicklime	22½	lbs.
Water	220	gallons.

Dissolve the sulphate by suspending it in a coarse cloth, in a wooden vessel containing the water. Slake the quicklime in a separate vessel, and after stirring thoroughly add water, pass it through a sieve into the copper solution, stir well, and add the remaining water. The quantity specified is sufficient for one acre of land.—Phar. Jour. Trans., 1892, 383.

Red Ant Nuisance.—C. V. Riley.—Scien. Amer.; Meyer Bros'. Drug., 1892, 281.

Insects on Fruit Trees.—Remedies against the caterpillars.—Chem. and Drug., 1893, 683.

Your Weeds and Your Neighbors.—C. F. Millspaugh.—Bull. West Va. Agric. Exper. Sta.

A Century of American Weed Seeds.—Byron D. Halsted. A collection of one hundred kinds of weed seeds.—Bull. Torr. Club., 1893, 51.

Trees—Identification of in Winter.—A. F. Foerste calls attention to the fact that annual growth of twigs is spoken of as being of use in forming an artificial classification. Other aids in identification are the color and marking of the bark, the character of the pith, the form and character of next year's flowering buds, the remains of last year's inflorescence, and the habit of the trees.—Bot. Gazette, June, 1892; Pharm. Jour. and Trans., 1892, 183.

——— E. P. Powell.—Am. Gard., 13, 706.

Diseases of Trees likely to follow Mechanical Injuries.—W. G. Farlow. Trans. Mass. Hort. Soc., 1891, 140.

PLANT CONSTITUENTS AND PHYSIOLOGY.

Plant Analysis.—A. Etard has devised a method of separating those proximate principles which accompany the green pigmentary matter in plants, in a manner similar to that adopted in isolating the elements of mineral substances.—Compt. rend., 114, 1116; Pharm. Jour. Trans., 1892, 42.

Recent Work in Botany.—S. Le M. Moore. Article on callus, paracallus and glucosides in cell-walls.—Jour. Linn. Soc. (Bot.), 29, 231 and 241; Pharm. Jour. Trans., 1893, 585.

Recent Work in Botany.—H. A. D. Jowett. Karyokinesis; internal phloem; central cylinder.—Pharm. Jour. Trans., 1893, 746.

Edible Wild Plants.—A writer in the British Medical Journal (June 11, 1892) calls renewed attention to the fact that in the absence of the cultivated plants there are many wild ones that might be substituted. He mentions the following: Common nettle, Barbara vulgaris, Cardamine impatiens, Rumex acetosa, Chenopodium album, C. bonus-Henricus, Atriplex patula and Salicornia herbacea, as substitutes for some of our common vegetables.—Pharm. Jour. and Trans., 1892, 4.

Vegetable Amyloid.—Winterstein describes this substance as occurring in the cell-walls of certain plants and giving the same reactions with iodine as starch.—Ber. d. Chem. Ges., xxv, 1237.

Anilophyll.—E. Schunek and G. Brebner describe, under the name of anilophyll, a brown crystallizable substance formed in many green leaves when treated with aniline.—Annals of Botany, vi, 167; Pharm. Jour. and Trans., 1892, 183.

Albumen in Plants—The Active.—O. Loew gives experimental grounds for the conclusion that not only the organized albumen of the living protoplasm, but also the albumen dissolved in the vacuoles—the unorganized albumen—is a different substance from the ordinary albumen which is present in dead cells.—(Liege Meeting of the International Congress of Physiologists.) Nature; Phar. Jour. and Trans., 1892., 325.

Carbo-Hydrates—Mode of Formation, by Plants.—Bokorny, in Biol.

Centralb., 1892, 481; Phar. Jour. Trans., 1892, 345. A fresh argument in favor of the view that formic aldehyde is the first product in the formation of starch and other carbo-hydrates by plants, is furnished by a series of experiments carried on by Bokorny.

Chlorophyll Solution—Aqueous and Spirituous.—A permanent dark-green non-fluorescent and non-poisonous solution of chlorophyll.—Merck's Ber., Jan., 1893.

Cholesterin, prepared from phanerogamous plants, according to Gérard (Compt. rend., cxiv, 1544), agrees in its properties with Hesse's phytosterin, melts at 132° C., and after complete drying at 135°, the rotatory power being at the same time increased from —34.4° to —36.5°. It is obtained by preparing an extract with ether, saponifying it with alcoholic potassa, exhausting the dried soap with ether, and evaporating; the acicular crystals are again treated with potassa, and the alkaline watery solution agitated with chloroform. The crystallized cholesterin may be still further purified by converting it into the benzoate, crystallizing repeatedly from alcohol, and saponifying.

Prepared from cryptogamous plants by a similar process, cholesterin gives the reaction of Tanret's ergosterin, but the melting point and the rotatory power differ to some extent.—Am. Jour. Pharm., 1892, 606.

Coloration of Flowers—Artificial.—The new industry of coloring flowers (pinks) green, has been the subject of study by G. Planchon, who, in May last, reported his results to the Paris Conseil d'Hygiène. It appears that the florists finding coloring matters frequently not rising in the tissues, overcome the difficulty by resorting to immersion. Basic coloring matters do not color flowers by ascension, but acid coloring matters generally are adapted for this purpose. The rapidity of ascension varies considerably; green acids rise quite rapidly, while blue, and particularly brown acids, penetrate only slowly to the flower. To color flowers by immersion, they are simply plunged into a solution of the appropriate dye-stuff. Watery solutions have usually no effect, owing to the secretion present upon the surface of most petals; but by means of alcoholic solutions the flowers become dyed after the evaporation of the alcohol. Such flowers, however, are less handsome in appearance than those colored by ascension. Many of the coloring matters that may be employed for the purpose indicated are harmless, but even of the poisonous kinds a very small quantity only is usually required, too little to be hurtful.—Am. Jour. Pharm., 1892, 470.

——— W. Brockbank.—Drug. Circ., 1892, 160; from Gard. Chron.

Coloration of Flowers.—C. E. Becker.—Meyer Bros'. Drug., 1893, 53.

Ancient Dyes—Notes on Some.—E. Schunck.—Mem. and Proc. Manchester Lit. and Phil. Soc., vol. v, ser. 4; Drug. Circ., 1893, 40.

Red Coloring Matters—Behavior of.—If a colored solution is to be ex-

amined for the identification of the coloring matter, the following test (first devised to detect aniline red in carmine) will prove serviceable: The solution is mixed with one volume chloroform and three volumes absolute alcohol and thoroughly agitated; two volumes of water are then added (without agitating the mixture), which causes the carmine to separate almost completely between the two layers of the liquids; aniline red in this test is found entirely in the chloroform layer. An examination of a number of red, vegetable coloring principles according to this test resulted as follows: Elderberry, most of the color remains dissolved, the upper layer having a rose-red, the lower layer a pale yellow color; the addition of ammonia gives a green color with both layers. Logwood, a violet separation, upper layer colored; ammonia colors the upper layer red the lower layer violet. Red rose, the coloring principle is yellowish-red, but separates completely with blue-violet color. Rhatany-extract, slight separation of brown color. Currants, the color separates almost completely of a rose-red color. Cochineal, violet ring, the coloring matter only separating partially. Red wine, rose-red ring, after adding ammonia the upper layer becomes dirty-yellow in color. Raspberry, rose-red ring after adding ammonia. Madder, red separation, chloroform-layer yellow. Alkanet, the coloring principle passes into the chloroform layer and is turned blue by ammonia. Red Saunders, the yellowish-red color is imparted to the chloroform, ammonia entirely decolorizing. De Groot, in Zeits. Oest. Apoth. Ver., 1892, 824.

Color—Origin of—Fluorescence—W. N. Hartley, in Chem. News, 1892, 298. A reply by H. E. Armstrong, ibid., 299, etc.

Coloring Matter of the Vine.—A. Gautier. The skin pigment of grapes is formed by the oxidation of aldehydic or catecholic substances, originating in the leaves and traveling thence to the fruit. The coloring matter yielded a mixture of two colored crystalline acids α- and β-ampelochroic acids. The latter alone is soluble in cold water.—Compt. rend., 114, 623; Jour. Chem. Soc., 1892, 1242.

Cork—The Crystalline Substance present in.—According to M. Kügler (L'Union Pharm., Nov. 30, 1892, p. 524), the crystalline substance which Istrati (L'Union, p. 450) extracted from cork is identical with that extracted by him from the same substance in 1884 (see Amer. Jour. Phar., 1884, p. 240). Kügler reserved for this body the name cerin, previously proposed by Höhnel, he having micrographically proven the presence of cerin crystals in cork cells. After a number of crystallizations this product has a fusing point, constant at 250°, and responds to the formula $C_{20}H_{32}O$. —Am. Jour. Pharm., 1893, 77.

Electric Light and Plant Structure.—G. Bonnier finds that direct electric light is prejudicial to the normal development of the tissues, on account of the ultra rays.—Phar. Jour. Trans., 1892, 344; from Compt. rend., 115, 475.

The Effects of Fog on Plants.—F. W. Oliver. A resumé of the salient features of the injuries caused by fog.—Phar. Jour. Trans., 1893, 931.

Glucosides in Plants.—Dr. v. Oefele explains the character and purpose of the glucosides as serving as a means of transport for the reserve materials of plants; hence the temporary or occasional occurrence of them in the various organs.—Pharm. Ztg., 1892, 374.

Gums—Polarimetric Examination of.—M. Ginschard.—Abstract in Chem. News, 1893, 168; from Bull. Soc. Chim. de Paris, ix and x, No. 2.

Gummy Substances and Pectin-like Bodies.—Garros, in Bull. Soc. Chim., vii, 625; Pharm. Centralh., 1893, 147.

Varnish Gums.—Zanzibar gum; Benguela and Angola gums; Manila copal; Kauri gum and Dammar gum.—Pharm. Record, 1893, 215; from Kuhlow's Review.

Leaves—Constituents of.—A. Etard (Comp. rend., cxiv) has investigated some leaf-constituents accompanying chlorophyll. The extract obtained with carbon disulphide was treated with alcohol, and the insoluble portion recrystallized from benzol and afterward from acetic ether. The leaves of Vitis vinifera yielded colorless vitol, $C_{17}H_{34}O$, melting at 74° and boiling near 300° C. Medicagol, $C_{20}H_{42}O$, from Medicago sativa, melts at 80° and boils at 395°. Bryonan, $C_{20}H_{42}$, from the leaves of Bryonia dioica, melts at 69° and boils at 400°. The alcohol solution, obtained as stated above from grape-vine leaves, contained fat acids and vitoglycol, $C_{23}H_{44}O_2$, the latter soluble in ether in the presence of alkalies.

This method may be used for separating the constituents into different groups. The extract obtained with carbon disulphide, on treatment with alcohol, leaves glycerides and the higher alcohols and glycols behind, while alkaloids, alcohols, glycols, chlorophyll and acids are dissolved, the latter being separated from the other compounds by means of weak alkali solution. On treating the leaves, exhausted with CS_2, with hot alcohol, an extract is obtained which may again be separated into different groups of constituents by means of cold alcohol and by ether.—Am. Jour. Pharm., 1892, 469.

Leaves—Chemistry and Physiology of Foliage.—H. T. Brown and G. Harris Morris. The investigation relates to the occurrence, relations, and physiological significance of the starch, diastase, and sugars contained in foliage leaves.—Phar. Jour. Trans., 1893, 978.

Significance of Leaves in the Economy of Nature.—A. Tschirch.—Pharm. Post, 1892, 65, etc.

Gases in Living Plants.—J. C. Arthur.—Am. Nat., Feb., 1893; Nature, March, 1893; Phar. Jour. Trans., 1893, 847.

Some Eccentricities of Plant Nutrition.—J. R. Green.—Phar. Jour. Trans., 1893, 845.

Micro-Organisms and Insectivorous Plants.—N. Tischutkin.—Jour. Royal Mic. Soc.; Pharm. Review, 1893, 38.

——— *in their Relation to Chemical Change.*—P. C. Frankland. Read at meeting of the Royal Ins., London.—Drug. Circ., 1892, 269.

Mucilaginous Seeds.—J. R. Jackson describes the following seeds: Ispaghul, Chia and Kanecha.—Chem. and Drug., 1893, 114.

Nectar—Chemical Composition of.—W. E. Stone has studied the chemical composition of the nectar of the Poinsettia pucherrima.—Bot. Gaz., xvii, 192.

Nitrogen during Putrefaction—Liberation of—Howard B. Gibson.—Am. Chem. Jour., 1893, 12.

Absorption of Atmospheric Nitrogen by Vegetation.—A summary of the dispute, and conclusions towards which science and practice are jointly tending.—Pharm. Jour. Trans., 1893, 595. (Also Chem. News, 1892, 398.)

Fixation of Free Nitrogen by Plants.—Schloesing and Laurent conclude that soils absolutely bare of vegetation, although containing appropriate micro-organisms, do not fix any free nitrogen.—Pharm. Jour. Trans., 1892, 442, from Compt. rend., 115, 659. Discussion in Compt. rend. See also Chem. News, 1893, 148.

Osmotic Pressure.—J. W. Rodger.—Phar. Jour. Trans., 1893, 552 and 593; from Nature, Dec. 1, 1893.

Pentosans in Plants.—G. De Chalmot.—Am. Chem. Jour., 1893, 276.

Soluble Pentoses.—Ibid., 21.

Perfume in Flowers.—Researches upon the mode of its production. E. Mesnard has employed a micro-chemical method as follows: The section being placed in a drop of pure glycerin is arranged upon a round cover-glass, which, being then inverted, serves as a cover to a small chamber, formed by cementing a glass ring to an object slide. In the interior of the chamber is fixed another ring of smaller diameter and somewhat less in height, thus forming with the first an annular space, in which the reagent may be placed. By adopting this arrangement the light passing through the central part of the cell is not modified. The inner ring will further serve to support a very small cover glass, upon which sections may be arranged which require to be exposed to the action of the reagent for some length of time, as occasionally happens in the case of the fixed oils. The reagent invariably employed is pure hydrochloric acid, the hydrated vapors from which are readily absorbed by the glycerin. In this way, by a gentle and easily regulated action, he obtains complete hydration of sections in the presence of an acid. When they have been exposed for a short time the essential oils appear as minute spherical drops of a fine transparent golden yellow. If the action be prolonged the drops disappear, being transformed into diffusible products. The tendency of the

globules is not seen in the fixed oils, so that it provides a means of distinguishing these two classes of products.

The author has experimented with Jasmin, Roses, Violets, Tuberose and Orange, and draws the following conclusions from his researches:

(1) That the essential oil is generally found localized in the epidermal cells of the upper surface of the petals or sepals, though it may exist upon both surfaces, especially if the floral organs are completely hidden in the bud. The lower surface generally contains tannin or pigments derived from it.

(2) The chloropyll seems, in every case, to give rise to the essential oil. This transformation is readily comprehended if it be admitted, as is generally understood, that the floral organs are but modified leaves found performing a new function. The chlorophyll being thus diverted from its original purpose, may be transformed into tannoid compounds or into essential oils.

(3) The liberation of perfume in the flower only becomes perceptible when the essential oil is sufficiently freed from the intermediate compounds which have given rise to it. Its formation is to some extent in inverse proportion to that of the tannin and pigments in the flower. This will explain why flowers with green petals possess no odor, why white flowers or roses are most frequently odoriferous, why the Compositæ which are so rich in tannin have a characteristic disagreeable odor, and why the cultivated white lilac and forced roses acquire a very fine perfume.—Am. Jour. Pharm., 1893, 91; from Pharm. Jour. and Trans., 1893, 549; adapted from Compt. rend.

Perfumes—Extraction from Plants.—In the course of a comprehensive paper on odors and the sense of smell, M. C. Henry briefly describes the various methods by which the perfumes of plants are extracted, classifying them under six heads; expression, distillation, maceration, enfleurage, pneumatic process and solution.—Rev. Scient., Pop. Science Monthly, xli, 682; Pharm. Jour. and Trans., 1892, 266.

——— It is proposed (U. S. patent) to inclose the growing flowers in a tight box, through which is forced a strong current of air. This air, becoming saturated with the volatile principles of the plant, is caused to pass through a number of vessels containing alcohol, which in turn take up the perfume.—West. Drug., 1892, 382.

Flowers—Scent of.—Some observations have been made at St. Petersburg in the relation of the scent of flowers to external conditions, and of these, Regel gives an account in the Acta Horti Petropolitani. The facts seem to indicate that the formation of the odoriferous substance stands in very close connection with the life of the plant.—Nat. Science, i, 411; Phar. Jour. and Trans., 1892, 182.

Analysis of Complex Odors.—J. Passy points out that pure substances of

definite composition do not necessarily possess simple odors.—Phar. Jour. Trans., 1893, 443; from Compt. rend., 115, 689.

——— J. Passy.—Compt. rend., 116, 769, 1007; Phar. Jour. Trans., 1893, 889, 987.

Perfume in Orchids.—E. Mesnard.—Phar. Jour. Trans., 1893, 808; Compt. rend., 116, 526.

Perfume Plants, Cultivation of, in South Australia.—The perfume farm of the South Australian Government, at Dunolly, is attracting much interest. The following oils have been distilled: peppermint, wild thyme, laurel, tansy, anise, lavender, verbena, etc. The director of the farm reports very successful experiments with the leaves of the iron bark. Several other species of encalyptus have also yielded very fragrant oils. An extract of vanilla has attracted considerable attention. Phar. Jour. Trans., 1892, 18; from Gardener's Chronicle.

Flower Farming in Victoria.—An account.—Chem. and Drug., 1893, 438.

Government Scent Farm, Dunolly.—An account of a visit there, with a list of plants cultivated there.—Phar. Jour. (Aus.), 1892, 215.

Phloroglucin in Plants.—To determine the presence of phloroglucin, T. Waage (Ann. Agron., 1892, p. 204,) makes use of Günzburg's reagent (see Amer. Jour. Pharm., 1888, p. 240); one drop of the vanillin solution (0.005 in 4.0 HCl) will detect 0.001 mgm. phloroglucin. He observed that gymnosperms are rich in phloroglucin, monocotyledons and gamopetalæ contain little, and polypetalæ are destitute of this compound. As a rule woody plants are richer than herbs, but the distribution in root, stem, and leaves of the same plant is nearly uniform. The author regards it as a by-product of plant life; it enters into the formation of very complex principles (phloroglucosides), is connected with the production of phlobaphenes and certain coloring matters, and is usually met with in plants containing tannin.—Am. Jour. Pharm., 1892, 515.

Arrow Poisons.—R. Hitchcock refers to the arrow poisons of the Ainos in a paper contributed to the report of the U. S. National Museum.—Phar. Jour. and Trans., 1892, 264; Nature, xlvi, 475.

Malayan Arrow-Poisons.—R. Stockman. Physiological experiments made by the author on Ipoh aker, Aker lampong and Prual.—Phar. Jour. Trans., 1893, 945 (also Kew Bull., 1891).

The Arrow-Poison of the Wa Nyika and Other Tribes of East Equatorial Africa.—T. R. Fraser and J. Tillie. A preliminary notice, with special reference to the chemical properties and pharmacological action of the wood of Acokanthera, from which the poison is prepared. Phar. Jour. Trans., 1893, 937.

Obeah Poisons and Poisoners.—E. M. Aaron.—Scien. Amer., West Drug., 1893, 60.

Ouabaio (Acokanthera).—E. M. Holmes identifies the wabei, wabajo or ouabaio arrow poison as being derived from Acokanthera Schimperi. The paper is illustrated by sections of the stem and root bark.—Phar. Jour. Trans., 1893, 965.

Crystallized Vegetable Proteids.—Thos. B. Osborne.—Am. Chem. Jour., 1892, 662.

Continuity of Protoplasm through the Cell-walls of Plants.—W. J. Beal and J. W. Toumey.—Amer. Month. Micros. Jour., 13, 129.

Resins and Tannins—Origin of.—Heckel and Schlagdenhauffen have made some observations on plants belonging to the genera Gardenia and Spermolepsis, which tend to show that there is a close relationship between resinous matters and tannin.—Compt. rend., cxiv, 1291; Phar. Jour. and Trans., 1892, 4.

Resins—Solubility of in Ethereal Oils.—G. Borneman gives in a table the solubility of 8 substances in 12 oils.—Pharm. Post, 1893, 274.

Saponin—That of Corn-cockle in Particular.—R. Kobert, in Pharm. Post, 1892, 1141. A review of 140 species in which this sapon-like body is found. Methods of extraction and purification.—Ibid., 1168. Older analyses of corn-cockle, physiological action, etc.—Ibid., 1189, etc.

——— Carl Kornauth.—Pharm. Post, 1893, 65.

——— T. F. Hanausek.—Chem. Zeit., 1892, 1643.

Saponin Substances in Plants.—Information regarding the occurrence, by T. F. Hanausek.—Chem. Zeit., 1892, 1295, 1317.

——— T. Waage in Pharm. Centralh., 1892, 657, 671, 685, 695, 712; 1893, 134.

——— M. Greshoff.—Ibid., 742.

Silica in Plants.—Berthelot and Andre.—Compt. rend., cxiv, 257.

Starch in Plants.—A. Prunet. The results of the author tend to confirm the general opinion that the digestion of nutritive matters is effected, not by the direct action of the protoplasm, but by means of diastasic substances produced as results of its activity.—Phar. Jour. Trans., 1892, 442; from Compt. rend., 115, 751.

Trehalose of Fungi.—E. Bourguelot.—Jour. Pharm. Chim., 1893, 113.

Trichosanthine.—A. Tschirch isolates this, the first green coloring-matter from the vegetable kingdom which differs decidedly from chlorophyll.—Schweiz. Wochenschr. Chem. Pharm.; Chem. Zeit.; Chem. News, 1892, 177.

NATURAL ORDERS.

Agavæ.

Agavæ of Brazil.—T. Peckolt contributes to the materia medica of

Agava americana L., Fourcroya gigantea Vent., F. cubensis Haw.—Pharm. Rund., 1892, 163.

Algæ.

Seaweeds.—E. M. Holmes. Seaweeds as applied in medicine and as food.—Phar. Jour. Trans., 1893, 735; Nat. Drug., 1893, 118.

The Medicinal and Economic Uses of.—P. L. Simmonds.—Bull. Pharm., 1893, 159.

Diatoms—The Cultivation.—An abstract of Miguels' paper in Compt. rend., 1892, in Nat. Drug., 1892, 7.

Alismaceæ.

Alismaceæ of Brazil.—T. Peckolt contributes to our knowledge of Alisma floribundum Seub. and Echinodorus macrophyllus Micheli.—Pharm. Rund., 1893, 136.

Alstroemiaceæ.

Officinal Alstroemiaceæ of Brazil.—T. Peckolt considers the various uses and medicinal properties of Bomaria salsilloides Röm., B. spectabilis Schenk., Alstroemeria Cunha Vellos. A. monticula Mart., A. caryophyllea Jacq.—Pharm. Rund., 1892, 162.

Amaryllidaceæ.

Amaryllidaceæ.—T. Peckolt contributes to the materia medica of the following Brazilian Amaryllidaceæ: Griffinia hyacinthina Ker., Amaryllus nivea Rom. et Schult., A. reginae Linn., A. fulgida Ker., A. principis Salm-Dyk., A. vittata L'Herit., Crinum scabrum Sims., Sancratium guianense Ker.—Pharm. Rund., 1893, 135.

Anacardiaceæ.

Rhus—Notes on the Genus.—T. J. W. Burgess.—Jour. and Proc. Hamilton Assoc., 1891–92, 119.

Anonaceæ.

Bocagea Dalzelii—Schimmel and Co.—Pharm. Post, 1893, 208.

Apocynaceæ.

Apocynum venetum.—Von Oefele describes an alkaloid, apocynteine, a cardiac sedative.—Jour. Pharm. Elsass.-Lothr., 1891, 325; Pharm. Centralh., 1892, 481.

Cerbera Odollam, Gærtn.—A supply of seed kernels from the Dutch Indies furnished the material for the following investigation: They contained 6.94 per cent. moisture, 2.41 per cent. ash, and by extraction with ether about 77 per cent. fat; by expression with moderate heating about 44 per cent. could be obtained. The active constituent, cerberin, was isolated by first expressing as much as possible of the oil, digesting with several portions of 80 per cent. alcohol, distilling off the alcohol, adding

water, separating the fat collecting upon the surface, and repeatedly agitating the solution with petroleum ether. After standing for some time, a black layer subsided which was separated from the supernatant liquid, washed with petroleum ether, dissolved in alcohol and filtered through purified animal charcoal; by repeated crystallization from alcohol and washing with ether, perfectly white crystalline cerberin was obtained. By this washing with ether a substance was removed melting at 175–176° C. The yield of cerberin in the first lot extracted was 0.16 per cent., while later only 0.08 per cent. was realized. The kernels had between the two operations become perfectly black, so that partial decomposition of the cerberin is very probable. Cerberin forms colorless, odorless, anhydrous crystals, having a bitter taste, and melting at 191–192° with some decomposition; it is easily soluble in ethyl, butyl and amyl alcohols, chloroform and glacial acetic acid, difficultly soluble in ether and benzole, and almost insoluble in petroleum-ether and water. The ultimate analysis and molecular weight determination indicate the formula $C_{27}H_{40}O_8$, agreeing with that obtained for *tanghinin* from Tanghinia venenifera, Poir. Of tests for cerberin may be mentioned: (1) Yellow color upon heating with dilute mineral acids. (2) With concentrated sulphuric acid a transient orange red; after 15–30 minutes a violet color appears first around the edge of the liquid, spreading throughout the liquid, finally passing into blue. (3) Con centrated sulphuric acid with phenols (thymols, *a*-naphthol, cresols or glycocholic acid), produces a red or violet coloration, while the acid with aldehydes (furfurol, saccharose, vanillin, heliotropin, etc.) produces blue colorations. By heating with a dilute alcoholic sulphuric acid, cerberin yields about 63 per cent. cerberetin, a reducing sugar (in very small amount), and very likely a third compound, since considerable loss was noticed and after separating the cerberetin poisonous physiological effects were still obtained. Cerberetin, a citron-yellow amorphous powder, is soluble in alcohol, ether, benzol and chloroform, giving intensely yellow colored solutions, insoluble in water and petroleum-ether; it melts at 85.5°: with concentrated sulphuric acid at first a red color is produced, changing to brown or violet; the acid with traces of aldehydes gives the same color as with cerberin; it has the formula $C_{19}H_{26}O_4$; and was found to be poisonous. A comparison of *cerberin*, *tanghinin* and *thevetin* (from Cerbera Thevetia L.), indicate that they are not identical.

	Cerberin.	Tanghinin.	Thevetin.
Melting point,	192°	182°	170°
Solubility in water,	1 : 5555	1 : 20000	1 : 222
Formula,	$C_{27}H_{40}O_8$	$C_{27}H_{40}O_8$	$C_{54}H_{84}O_{44}.H_2O$
Decomposition products	Yellow cerberetin $C_{19}H_{26}O_4$ and little sugar.	Yellow resin but no sugar.	White theveresin $C_{48}H_{70}O_{17}$ and sugar.

P. C. Plugge, Arch. der Pharm., 1893, 10–34.

Cerberin is a glucoside obtained from a Mexican plant of the genus Thevetia. It is a yellowish, amorphous, bitter powder, easily soluble in water and alcohol; the action of dilute sulphuric acid produces glucose and cerberesin. Dr. Zotos (thesis, Dorpat, 1892) shows its physiological effects on the heart, when administered hypodermically, to be analogous to those of the digitalis group.—L'Union pharm., Feb., 1893, 90; Am. Jour. Pharm., 1893, 175.

Nerium Oleander (Rosa francesa).—A contribution to the pharmacognosy and pharmacodynamics, by Rivero and Beltran.—Rev. de cien. med. Habano, 1892, vii, 225.

Strophanthus.—T. R. Fraser, in a paper published in the Trans. of the Royal Soc. of Edinburgh, gives a comprehensive account of the history of the introduction of this drug, as well as the botany, chemistry and pharmacy, although the most valuable part is that dealing with the pharmacology, of Strophanthus.

The measurements of the seeds and comose appendages are particularly interesting. Seeds from 16 inch pods are practically double the weight of those from 8 and 10 inch pods, and they vary in weight according to their position in the pod, as the following figures show:

—	Top	Middle	Base
	Grain	Grain	Grain
8 inch pods	0.31	0.30	0.20
10 " "	0.48	0.41	0.35
16 " "	0.67	0.84	0.45

These are the mean of two weighings from the respective positions, but some, especially those from the top of the longest, showed a wide variation—*e.g.*, 0.45 and 0.88 grain in that case. The extreme limits of weight noticed were 0.15 grain and 0.88 grain. The measurements of the comose appendages show that the longest occur at the middle of each pod, and the shortest are more frequently at the base than at the top. The extremes observed were 1.99 inch and 5.93 inches, the former being from the base of an 8 inch pod, and the latter from the middle of a 16 inch. Occasionally smaller and larger appendages have been noticed—as, for instance, 1.59 inch and 6.03 inches—the shortest and longest known—but these are rare.

Very dilute mineral acids (likewise acetic and oxalic acids on boiling) decompose strophanthin. A simple test for the tincture may be applied as follows: Evaporate a few minims of it, and dissolve the soft residue in a drop of water placed on a microscope-slide provided with a shallow cup. Now add a drop of 2-per cent. sulphuric acid, and apply the cover-slide. In one or two days a large number of small and translucent granular

bodies make their appearance, and in three or four days a beautiful crystallization of strophanthidin in star-like masses may be observed. The existence of active principle throughout the plant is shown in the following figures:

Seeds contain about			5.3	per cent.	of	strophanthin.	
Comose appendages contain about			0.42	"		impure	strophanthin.
Placenta	"	"	0.62	"		"	"
Endocarp	"	"	0.91	"		"	"
Pericarp	"		traces			"	"
Leaves	"		"			"	"
Branch bark	"		none.				
Stem bark	"		"				
Root	"	"	0.73	"		"	"

—Chem. and Drug., 1893, 451.

Strophanthus Seed of Commerce.—E. M. Holmes gives a resumé of what is known concerning this powerful drug, its botanical sources and means of identification.—Phar. Jour. Trans., 1893, 868 and 927; reprinted, Amer. Jour. Pharm., 1893, 342.

——— of Pharm. Germ. III. Bericht of Gehe and Co.—Pharm. Centralh., 1892, 567.

——— Stems of the Plants yielding. F. Pax.—Pharm. Centralh., 1893, 91.

Strophanthus Seeds—Qualitative Examination of.—C. Hartwich. For the valuation of the seeds the presence of strophanthin should be ascertained in the following manner: A cross-section of the seeds is placed on a glass slide and covered with a drop of concentrated sulphuric acid. The endosperm should at least assume an intense green color, which is easily seen with a hand glass. Often the green is preceded momentarily by a blue color. The cotyledons are also colored green, but generally less intensely than the endosperm. Gradually the color changes through blue into red and after ¼–1 hour it disappears. In seeds which contain but little strophanthin the endosperm alone is colored green, while the embryo is colored yellow and then red, or the epidermis and the adjacent cells are only colored in addition.

TESTS FOR TINCTURE AND EXTRACT OF STROPHANTHUS.

For testing the tincture 3 drops are taken, and for the extract a piece a little larger than a pin-head. In either case mix the same with a half drop of ferric chloride solution and 3 drops of sulphuric acid. A brown precipitate is formed, which is distinctly green after one hour, and should retain the color for fully 3 hours.

Among the seeds examined by the author which failed to give the strophanthin reaction were the varieties Senegal, Lagos, and a number of others.—Arch der Pharm., 1892, 401.

——— *Constituents of.*—J. J. Hofman has obtained from green strophanthus-seed, by treatment with petroleum ether, 32 per cent. of a fatty oil, while the brown seed, treated in the same way, yielded 29 per cent. The specific gravities of these oils were 0.9125 and 0.9313, the iodine-absorption numbers (by Hübl's method) 83 and 96, the saponification numbers 183 and 193. The bulk of the oil appears to consist of the ester of oleic acid. Of odorous fatty acid there were only very minute traces present.—Chem. and Drug., 1892, 389.

Urechites Suberecta.—The leaves of this plant, which is indigenous to Jamaica, according to Stockman (Rev. de Clin. et de Thér., June 29, 1892) contains an alkaloid, urechitine, and a glucoside, urechotonine, resembling digitalis in its action. The alkaloid is toxic, producing emesis, muscular weakness and arythmy and lessening of the heart-beats. The glucoside has nearly the same properties, but is less toxic. It is improbable that Urechites suberecta will ever prove to be of value as a cardiac tonic, as it possesses, in a high degree, the objectionable accumulative properties which have been so often remarked in the case of digitalis.—Am. Jour. Pharm., 1893, 16, 192.

Folia Vincæ pervincæ.—Hager, in Pharm. Post, 1893, 102.

Aquifoliaceæ.

Paraguay Tea.—Mr. N. E. Brown gives five species of Ilex as those from which Maté is obtained, viz.: (1) Ilex Paraguayensis, St. Hil.; (2) Ilex fertilis, Reiss; (3) Ilex Humboldtiana, Bonpl.; (4) Ilex ovalifolia, Bonpl.; (5) Ilex nigropunctata, Miers; (6) One in cultivation at Kew as the maté plant.—Kew Bull., 66, 133; Phar. Jour. and Trans., 1892, 85.

Araceæ.

Araceæ of Brazil.—Peckolt writes upon the following official and nut-bearing Araceæ of Brazil: Anthurium oxycarpum, Poepp.; Monstera pertusa, De Vriese; Urospatha caudata, Schott; Dracontium polyphyllum, Linn.; D. asperum, C. Koch; Montrichardia linifera, Schott; M. arborescens, Schott; Syngonium vellosianum, Schott; Philodendron guttiferum, Kunth; P. Imbé, Schott; P. ochrostemon, Schott; P. cordatum, Kunth; P. lacinatum, Engl.; P. squamiferum, Poepp.; P. speciosum, Schott; P. bipinnatum, Schott; P. Selloum, C. Koch; Diefenbachia Seguine, Schott; Caladium striatipedes, Schott; Caladium sororium, Schott; C. bicolor, Vent.; C. bicolor Vent., var. Vellocianum, Engl.; C. bicolor Vent., var. Verschaeffltii, Engl.; C. bicolor Vent., var. poecile, Engl.; C. picturatum, C. Koch; Xanthosoma sagittifolium, Schott (Mangarito dedo de negro, M. royo and M. branca); X. violaceum, Schott; X. atrovirens, C. Koch et Bouché, var. appendiculatum, Engl.; X. auriculatum, Riegel; Colocasia antiquorum, Schott, var. typica, Engl.; C. antiquorum, Schott, var. Tonta-

nesii, Engl.; C. antiquorum, Schott, var. esculenta, Engl.; C. antiquorum, Schott, var. nymphæifolia, Engl.; C. antiquorum, Schott, var. acris, Engl.; Alocasia indica, Schott; A. macorrhiza, Schott; Staurostigma Luschnathianum, C. Koch; Pistia stratioles, Linn., var. obcordata, Engl.—Pharm. Rund., 1892, 279; 1893, 35.

Araliaceæ.

Panax Gums.—J. H. Maiden (Pharm. Jour. Trans., 1892, 441; from Proc. Linn. Soc., N. S. W., vii, 35,) gives detailed descriptions of several varieties of gum obtained from members of the genus Panax (Araliaceæ). He states that they closely resemble acacia gums in composition. The portions soluble in water consist entirely of arabin, and the remaining gums are partially soluble, though containing varying proportions of metarabin, which causes them to swell in cold water. It is suggested that the product of P. Murrayi would form a valuable substitute for gum arabic.

——— F. A. Flückiger. An article on New Australian gums.—Pharm. Post, 1892, 1237.

Aristolochiaceæ.

Aristolochia mexicana.—A. L. Herrera.—Bull. Soc. Roy. Brux., 1893, 37, 93; Chem. Zeit. (Rep.), 1893, 125.

Tlalocopetate or Tlalocopetlatl.—Summary by H. H. Rusby.—Bull. Pharm., 1892, 471.

Asclepiadaceæ.

Morrenia brachystephana, a plant of the Argentine Republic, known as *tasi*, is an excellent galactagogue, according to Del Arca and Sicardi (Semaine méd., July, 1892). An infusion is prepared of the leaves or root, 50 Gm. to water 200 Gm.; or a decoction of 40 Gm. of the fruit. The medicine is taken by the wet-nurses during the day in tablespoonful doses. —Am. Jour. Pharm., 1893, 16.

Condurangin.—See Alkaloids.

Berberidaceæ.

Berberis—Alkaloids of.—See alkaloids, glucosides, etc.

Podophyllum Emodi.—J. C. Umney (Year-book of Pharm., 1892, 395).

Extraction of the Resin.—The powdered rhizome was treated exactly in the manner described in the official process for the preparation of podophyllin resin, and was found to yield 11.4 per cent. of a pale lemon-yellow resin.

The solution from which the resin had been precipitated was markedly sweet in taste, and reduced Fehling's solution powerfully without inversion. It was found after concentration to possess no purgative action whatever, and was not further examined.

Separation of Constituents of Resin—Podophyllotoxin.—Ten grams of the crude resin were exhausted by dry chloroform, free from alcohol, the bulk of the chloroform removed by distillation, and the residue poured into a large quantity of dry ether. The portion insoluble in ether was at first pasty, but afterwards became dry and brittle. (This substance is distinctly acid, and is described by Thompson as podophyllotoxin, but corresponds to the inert podophyllic acid obtained from P. peltatum by Podwissotzki.) The ether-chloroform solution was then filtered into a large volume of petroleum ether, when the podophyllotoxin was precipitated. This, when collected, washed and dried over sulphuric acid, was found to be equivalent to 17.8 per cent. It was readily soluble in chloroform, gave no precipitate with ether, indicating complete removal of podophyllic acid, but gave a deep green coloration with ferric chloride. This reaction pointed to the presence, as an impurity, of a body similar to that described by Podwissotzki and named by him podophyllоquercetin, which will be described subsequently.

Podophyllotoxin is not soluble in solution of ammonia, but on heating with it is decomposed, forming a gelatinous precipitate and a frothy solution. The solution in ammonia, when shaken with ether and the ether evaporated, yielded abundant groups of long white needles of picropodophyllin.

Picropodophyllin.—Ten grams of the crude resin were exhausted with cold chloroform and the solution evaporated to dryness. This was extracted with boiling petroleum ether and the residue dissolved in rectified spirit, mixed with lime and dried on a water-bath, and finally exhausted with boiling absolute alcohol. The solution on evaporation and addition of water yielded an abundance of silky, needle-shaped crystals. These melted after recrystallization at 208–210° C., and are undoubtedly identical with the crystalline substance obtained by Podwissotzki from P. peltatum, which melted at 200–210° C.

The quantity obtained was small, amounting to 2.6 per cent. of the resin, although a slightly larger percentage was obtained by direct treatment of the rhizome as recommended by Podwissotzki.

Picropodophyllic Acid was obtained by treatment of the crude podophyllotoxin in solution in alcohol with ammonia, removing the picropodophyllin with ether, and then liberating the acid from its ammonium salt by dilute hydrochloric acid. Considerable difficulty was experienced in purifying the acid, owing to the readiness with which it is decomposed, and the impossibility of freeing it entirely from picropodophyllin. It is resinous in character, and agrees closely in general properties with the similar body obtained from *Podophyllum peltatum.*

Podophyllic Acid was precipitated from the chloroformic solution by ether (as mentioned already under the heading of podophyllotoxin) in

quantity equivalent to 30.8 per cent. It was thrown out in white flocks, which rapidly aggregated, forming a brown resinous mass, but which, after drying, was easily reduced to a pale grayish powder. It was distinctly acid to litmus, and melted at about 125° C. It was soluble in chloroform and alcohol, but insoluble in ether and water. It possessed when free from picropodophyllin no cathartic action whatever, and hence the description of this ether precipitate by Thompson as podophyllotoxin, the name applied by Podwissotzki to the active ingredient of the resin, has led to misconception. It was found necessary to remove the precipitate of podophyllic acid at once from the ether and chloroform solution, as its precipitation causes the crystallization of a part of the picropodophyllin, and may lead to a considerable loss of that body.

Podophylloquercetin.—The crude resin after extraction with petroleum ether and dry, alcohol-free chloroform was dried and extracted with ether, the ethereal solution concentrated and precipitated as a bright orange powder by alcoholic solution of lead acetate. The lead compound was decomposed by sulphuretted hydrogen and the liberated podophylloquercetin shaken out with ether. It was crystallized by the addition of benzole to the ethereal solution, and was purified by sublimation. The crystals, which became green on exposure to air, melted at 248° C., with slight decomposition. The amount obtained was equivalent to 1.35 per cent. of the resin.

Fatty Matter.—Petroleum ether removed from the crude resin 2.3 per cent. of a greenish fat, which differed from that obtained from the resin of *P. peltatum* in being non-crystalline and semi-fluid, whilst that from the latter exists in larger quantity, and is distinctly crystalline in character.

Podwissotzki, in his examination of the resin of *P. peltatum*, makes no mention of the proportions of the various bodies separated therefrom, and on this account experiments under similar conditions have been made upon a sample of the resin from the rhizome of this species, to determine its relative composition.

	P. Emodi.	P. peltatum.
Resin by official process for podophyllin resin	11.4 p. c.	5.9 p. c.
Constituents of the resin—		
Podophyllotoxin (crude)	17.8	33.8
Pure crystalline picropodophyllin	2.6	4.5
Picropodophyllic acid.....	not determined.	not determined.
Podophyllic acid	30.8	6.9
Podophylloquercetin	1.3	2.4
Fatty matter.....	2.3	5.7

The supposition of Podwissotzki that the activity of resin of podophyllum is dependent on the amount of picropodophyllin which it contains in solution in picropodophyllic acid, receives confirmation from the above figures, which show that the resin from *P. Emodi* yields a considerably smaller

proportion of crystalline picropodophyllin than *P. peltatum*. The near relationship of the roots is evidenced by the close agreement in character of their several constitutents, but the value of *Podophyllum Emodi*, dependent on the larger quantity of resin present in it, is counter-balanced by the smaller proportion of the active ingredient present in that resin. To summarize briefly; the rhizome of *Podophyllum Emodi* yields nearly double the amount of resin yielded by *P. peltatum*, but that resin contained only about half the quantity of crystalline picropodophyllin to which the value as a cathartic is due.

Hence it is undesirable that *P. Emodi* should be employed as an alternative source for the preparation, according to the official process, of podophyllin resin.

Additional Notes.—At the meeting of the British Pharmaceutical Conference, where the above paper was read, Mr. Moss stated that, like Mr. Umney, he had obtained a larger proportion of resin from the Himalayan drug than from *Podophyllum peltatum*, but that its action was most capricious. In a communication to the Pharmaceutical Journal, November 26, Mr. Umney states that eleven males, varying in age from 18 to 55 years, took doses of half a grain, without any marked cathartic action (except in one instance) being observed. He further remarks that "The experiments of Thompson cannot be taken into comparison with results which I have obtained, as he applies the name podophyllotoxin to the substance precipitated by ether, whereas Podwissotzki classifies it as inert podophyllic acid."—Am. Jour. Pharm., 1893, 24; See also Pharm. Jour. Trans., 1892, 207, 440.

Podophyllinum purissimum.—Preparation by E. Merck.—In Merck's Ber., Jan., 1893; Pharm., Centralh., 1893, 62.

Bixineæ.

Annatto.—English annatto-makers report both seed and dye, from Bixa Orellana, L., grown and prepared in the Andaman and Nicobar Islands, to be valueless in the home market, since the quality of the Ceylon product is such as almost to prevent competition.—Pharm. Jour. and Trans., 1892, 264; from Kew Bull.

Gynocardic Acid.—A method of extraction from Chaulmoogra oil by Petit.—Jour. Pharm. Chim., xxvi, 445; Pharm. Post, 1893, 7.

Hyaenanche globosa, Lamb., seu Toxicodendron Thbg.—A South African plant; the rind of the fruit contained an indifferent bitter principle similar to picrotoxin (3.9 per cent.)—Abstract, Pharm. Post, 1893, 107; from Inst. of Dorpat.

Bromeliaceæ.

Ananassa sativa (*Pineapple*).—Notes on the ferments contained in the juice of pineapples, together with some observations on the composition

and proteolytic action of the juice. R. H. Chittenden.—Tr. Conn. Acad. Arts and Sc., 1888–92, 281–308.

Burseraceæ.

Elemi—A New.—J. H. Maiden describes an exudation from the Canarium Muelleri, which resembles elemi in its general chemical characteristics. It possesses a delicious odor, recalling that of lemon, which becomes so prominent when the substance is digested in cold alcohol that the oleoresin may almost be classed as a perfume.—Proc. Roy. Soc., Queensland, viii, 3; Phar. Jour. and Trans., 1892, 6.

Incense—Preparation for Church.—J. C. M'Walter.—Brit. and Col. Drug.; West. Drug., 1893, 17.

Myrrh—Test for.—As it has been found that bdellium is often substituted for myrrh in commerce, Gottschling (Berl. Drog.-Zeit.) recommends the following as an easy method of detecting the adulteration: Samples are selected from among the suspected pieces, especially those of an unusually dark color, and triturated separately. Two grams are then taken from each, and 5 grams of alcohol poured over them in test-tubes, which are carefully heated with frequent shaking. The mixture is allowed to boil for one minute, after which 20 drops of pure nitric acid are added, and the whole kept nearly boiling for from 5 to 7 minutes longer by passing through the flame. Pure myrrh will show the following changes: The alcoholic solution first becomes turbid, then clears under the action of the acid and turns to a pale yellow. Continued heating darkens it, and renders it again turbid, the color finally changing, when the tube is held up before the light, to a dirty violet. If the sample is allowed to stand, it gets darker and more turbid for a quarter of an hour, after which, however, the peculiar violet coloration disappears, and it becomes almost black. Bdellium, on the other hand, when treated as above with alcohol, though likewise making a turbid solution that clears under nitric acid, does not yield the violet coloration; moreover, it remains clear to the last. Its odor is that of nitrous ether.—Drug. Circ., 1892, 180.

Myrrh Preparations—New.—M. Kahn, in München. Med. Wochenschr., 1892, 551.

Cactaceæ.

Prickly Pear as a Poultice.—B. N. C. Fletcher has used a poultice of wild cactus for wounds and to relieve rheumatism.—Kew Bull., 66, 144; Phar. Jour. and Trans., 1892, 84.

Capparideæ.

Mærua arenaria, H. F. and T.—The "Earth Sugar" Root of the Tamils.—David Hooper. The sweet roots used in Indian medicine chiefly belong to plants of the natural order Leguminosæ, and consist of *Glycy-*

rhiza glabra, *Abrus precatorius*, *Taberniera nummularia*, and *Alysicarpus longifolius*. The first of these is the well-known liquorice, and the remainder are called wild liquorice, and are used as substitutes for the true kind. Besides these, in Southern India, a drug described in native works of great antiquity and sold in the bazars is the *Poomichacarei kalung*, derived from *poomi*, the earth, *chacarei*, sugar, and *kalung*, root. The botanical origin of this root is Mærua arenaria. Roxburgh describes this plant under the name Capparis heteroclita, R.

The roots are plump when fresh, 1 to 1½ inches in diameter, long, cylindrical, contorted, with a light brown surface. When dried they become darker in color and wrinkled longitudinally, and several irregularly disposed transverse markings of a lighter color are observed on the surface. The transverse section of the root exhibits an internal hard woody centre of a yellowish color, and several similar but smaller woody bundles are scattered throughout the waxy looking parenchyma of the cortical portion. In the bazars the drug is sold in circular discs, like calumba root, having been sliced transversely when in a fresh state and allowed to dry in the sun. The taste is sweet and mawkish, and there is no distinctive odor as there is in liquorice root.

Sections of the root examined by the microscope exhibited no starch or crystalline matters in the cells, but yellow granular matter and oil globules were present. The central woody column and woody bundles in the cortical portion were made up of large lignified cells.

Chemical analysis showed it to contain oleic and palmitic acids, sugar and albumen. Invert sugar, 41.2 per cent. Negative results were obtained for either an alkaloidal principle or a substance similar to glycyrrhizin.—Pharm. Jour. and Trans., 1893, 548.

Gynandropsis pentaphylla, *D. C.*—Called variously hur-hur, bahakhra and kanphuti.—R. P. Banerjee. Med. Rep., Calcutta, 1892, 196.

Caryophyllaceæ.

"*Bikhma*"—*False*.—C. J. H. Warden and Chuni Lal Bose. Analysis of a drug labelled bikhma from Monghyr. According to Dr. Dymock the roots possess no resemblance to any kind of aconite. The results of the proximate analysis of the false bikhma may be stated thus:

Moisture	6.23 per cent.
Petroleum ether extract	1.173 "
Acid ether extract	.123 "
Alkaline ether extract	.048 "
Chloroform extract	.064 "
Amylic alcohol extract	1.58 "

The most important constituents of false bikhma are saponins. They have adduced some evidence to indicate that at least two saponins are

present. It is possible that false bikhma may be derived from either Acanthophyllum macrodon or Gypsophila paniculata.—Pharm. Jour. and Trans., 1892, 302–305.

Chenopodiaceæ.

Paico.—This name designates in Chile the two species, Chenopodium (Ambrina) ambrosioides and C. chilensis. Part used, flowering tops; constituent, an amber-colored volatile oil. Used in chronic catarrh of the digestive tract, in dose equivalent to 20 centigrams.—Rép. de Pharm., 1893, 120.

Combretaceæ.

Myrobalans—Preliminary Proximate Analysis of a sample of Commercial.—By A. C. Stark. The fruits on which the analysis were performed were derived from Terminalia Chebula, and T. citrina. The following list represents only the substances contained in the various extracts in general terms:

Moisture	7.05
Ash, soluble in water	1.202
Ash, soluble in HCl	.872
Insoluble ash (silica?)	.230
Fatty matter (partly free fatty acid)	.482
Fatty matter, soluble in chloroform (wax?)	.028
Gallic acid	3.020
Green resin, soluble in alcohol	.540
Brown resinous matter, soluble in ether	.970
Tannins precipitated by acetate of copper	20.600
Matter precipitated by lead, not by copper acetate (containing bitter principle)	1.900
Glucose	1.130
Saccharose and other carbohydrates	1.250
Phlobaphane	.860
Brown coloring matter, soluble in water	.350
Green resinous matter, insoluble in alcohol, ether, and chloroform, soluble in caustic soda	.710
Loss	.100
Total matter soluble in water	5.100
Residue unexamined	53.606
	100

—Brit., Pharm. Conference. Phar. Jour. and Trans., 1892, 253, 254.

Commelinaceæ.

Commelinaceæ of Brazil.—T. Peckolt contributes, in Pharm. Rund., 1892, 256, to the materia medica of some of the common drugs of Brazil: Dichorisandra thyrsiflora, Mix.; D. procera, Mart.; D. penduliforma, Kunth; D. (?), Campelia Zanonia, Rich.; Tradescantia diuretica, Mart.; Commelina geniculata, Vellos.; C. agraria, Kunth; C. robusta, Kunth; C. Pohliana, Seub.; C. scabrata, Seub.; C. deficiens, Hook.

Compositæ.

Artichokes—Alcoholic Fermentation of.—Lévy, in Compt. rend., cxvi, 1381.

Jerusalem Artichoke—Composition and Cultivation.—G. Lechartier.—Abstract, Jour. Chem. Soc., 1892, 1024.

Arnica montana.—B. Börner finds that the flowers of this plant contain a fat consisting of the glycerin esters of lauric and palmitic acid, together with about 1 per cent. of a hydrocarbon of the series $C_nH_{n2}+2$. *Arnicine* $C_{12}H_{22}O_2$ separates from an acetone solution as a crystalline mass, which deliquesces on exposure to air; it melts at 40° and boils at 83° C., dissolves in ether, alcohol or benzol, but is insoluble in water or alkaline solutions.—Apoth. Zeit., vii, 441.

Calendula officinalis—Occurrence of a Cholesterin, the Coloring Matter in the Flowers of.—A. Kirchner.—Inaug. Dissert. Erlangen.

——— *The Constituents of the Flowers of.*—F. A. Wirth.—Ibid.

Flores Chrysanthemi.—An illustrated account of the microscopical characters. T. F. Hanausek.—Pharm. Post, 1892, 717, etc.

Insect Powder—Caucasian.—A pharmacognostical and illustrated account of the examination by J. Malfatti.—Pharm. Post, 1893, 165, etc.

——— *Constituents.*—In continuing their investigations, Schlagdenhauffen and Reeb obtained, by distilling Dalmatian insect powder with steam, a pale yellow oil of a chamomile-like odor, in which is suspended a small quantity of a crystalline substance. The aqueous distillate contained formic, acetic and propionic acid and another organic acid, which was found to be poisonous, called *chrysanthemic acid;* the sodium salt of this acid is insoluble in alcohol. The residue from the distillation was found still to have toxic properties; by extracting this residue with petroleum-ether, evaporating, dissolving in alcohol, neutralizing with potassa, evaporating to dryness, taking up with water, filtering, acidifying filtrate with tartaric acid, extracting with ether and evaporating the ethereal solution, another poisonous acid, *pyrethrotoxic acid,* was obtained as a yellow, uncrystallizable, buttery mass, which was found to be very easily soluble in alcohol, chloroform, benzin, benzol, acetic ether and acetone. Caucasian insect powder yields almost identical results.—Chem. Centr.-Blatt; Pharm. Ztg., 1892, 374.

——— *Synthetic.*—E. Soxhlet gives the following in Drog. Zeit: Finely powdered oak bark, wormwood and chamomile, of each 1 kg.; curcuma, ¼ kg., and starch, ¾ kg. The powders are thoroughly mixed and incorporated with a mixture of 5 Gm. angelica oil, 5 of eucalyptus oil, 10 of cajuput oil, 5 of blue chamomile oil, 3 of oil of hyssop, 10 of ethereal oil of bay, 5 of wormwood oil, and 2 of oil tansy; all dissolved in ¼ liter alcohol.—Pet. Mon. de la Pharm., 1893, 1241.

Insect Flower Market.—Statistics and editorial comments.—Chem. and Drug., 1893, 730.

Cynara Scolimus.—Inulin in.—L. Hattyasy.—Trans. from Gior. d. v. Accad. di med. di Torino, 1891, 3, s. xxxix; Arch. ital. de Biol., Turin, 1892, 256–274.

Elecampane.—C. J. S. Thompson.—Its history, preparations and therapeutic use.—Brit. and Col. Drug., 1893, 45.

Eupatorin.—See Alkaloids, Glucosides, etc.

Inulin.—See Alkaloids, Glucosides, etc.

Eupatorium perfoliatum.—Analysis of the root, by H. F. Kaercher. A quantity of the root was collected in North-eastern Ohio, and, after carefully drying, was submitted to proximate analysis with the following results:

	Per cent.
Fat and resin (soluble in ether)	0.60
Resin and bitter principle (soluble in alcohol)	1.59
Mucilage	1.75
Dextrin	3.00
Glucose	1.45
Saccharose	5.60
Undetermined extractive (soluble in water)	4.90
Soluble in dilute sodium hydrate solution	2.42
Soluble in diluted hydrochloric acid	2.70
Inulin	4.90
Other products (soluble in hot water)	3.40
Lignin	17.62
Cellulin	24.69
Ash	10.67
Moisture	12.40
Loss	2.31
Total	100.00

There are probably also present a tannin, a glucoside, a resin and a bitter principle. The latter gave no reactions with either alkaloidal or glucosidal reagents.—Am. Jour. Pharm., 1892, 510, 511.

Indigo—Paraguay.—A blue dye is produced from the leaves of the Eupatorium læve, D. C. (E. tinctorium, Pohl), which is said to be somewhat darker than indigo, but otherwise extremely good.—Kew Bull., 68, 179; Pharm. Jour. and Trans., 1892, 182.

Grindelia robusta.—After reviewing the various analyses published (Am. Jour. Pharm., 1888, 433 and 440), Dr. A. Schneegans records results obtained in examining the saponin and in testing for alkaloids. Two kilos of the dried drug, finely cut, were repeatedly boiled with water, the decoctions mixed, allowed to cool, and filtered; the filtrate was precipitated with an excess of neutral lead acetate, the precipitate collected, washed

with a dilute lead acetate solution until the washings ceased to give a precipitate with basic lead acetate, and then suspended in water, decomposed by dilute sulphuric acid and the excess of this at once neutralized by addition of lead carbonate. After filtering, the liquid evaporated, left a small quantity of a brown, resinous mass, which was soluble in great part in boiling, dilute alcohol; the addition of three volumes of chloroform to this solution caused a voluminous precipitate; the precipitation was made complete by adding ether to the filtrate, and the precipitate further purified by solution in alcohol and precipitation with ether. Dried over sulphuric acid, the precipitate formed a yellowish powder, easily soluble in water and dilute alcohol, but almost insoluble in absolute alcohol; the aqueous solulution has an acid reaction, foams upon agitation, and reduces Fehling's solution after boiling with acid; lead acetate forms a yellow precipitate soluble in acetic acid; concentrated sulphuric acid dissolves the powder with reddish, yellow color, which upon heating becomes deep red; ammonia, nitric and hydrochloric acid dissolve it with a yellow color.

The filtrate from the lead acetate precipitation was concentrated, filtered and precipitated with *basic* lead acetate, the precipitate being washed and decomposed as above. The aqueous solution of the precipitate was then treated with *neutral* lead acetate to remove the last portions of the substance already described, the filtrate evaporated to dryness and exhausted with alcohol; this solution gave a precipitate upon addition of ether which after purification and drying formed an almost colorless powder, easily soluble in water and dilute alcohol, forming slightly acid solutions; it reduces Fehling's solution after boiling with acid, is precipitated by *basic* but not by *neutral* lead acetate. The *saponin* present, therefore, is made up of *two glucosides*, differing from the saponin isolated by Kobert from senega and quillaja in but one respect, namely, a slightly acid reaction of the one precipitated by basic lead acetate. The filtrate from the basic lead acetate precipitation was made alkaline with soda, extracted with ether, and the thick, brown, alkaline liquid purified by solution in acid, washing with ether, again liberating by soda. The aqueous solution of the substance gives precipitates with phosphomolybdic acid, Mayer's reagent, potassium tri-iodide, tannin, etc., but the quantity of the substance present in the drug is so slight that it appears venturesome at present to speak of an alkaloid in Grindelia robusta.—Journ. d. Pharm. Elsass-Lothringen, 1892, 133; Am. Jour. Pharm., 1892, 369.

Grindelia.—E. L. Greene. A discussion of certain species of Grindelia, with descriptions of two new ones.—Pittonia, 2, 287.

Helenin.—See Alkaloids, Glucosides, etc.

Liatris spicata.—W. F. Henry. The conclusions of an analysis by the author were that the drug does not contain any constituents of sufficient importance to warrant a belief in its medicinal activity. No alkaloids or glucosides were found. He obtained a trace of volatile oil, resin, wax, a

substance resembling caoutchouc, mucilage, glucose, saccharose, dextrin, albuminoids and inulin. Of the latter 16.00 per cent.—Am. Jour Pharm., 1892, 603.

Pyrethrum—A Study upon.—V. Verneau.—Montpelier, 1892, Thesis, No. 512.

Santonin.—See Alkaloids, Glucosides, etc.

Senecic Acid.—Shumoyamo has obtained from the leaves of Senecio Kæmpferi, a Japanese evergreen, which has the property of coloring the skin red, an acid to which this property is due. It forms colorless, acicular crystals, sparingly soluble in cold water, but readily soluble in hot water, alcohol, ether and chloroform.—Apoth. Zeit., vii, 453; Pharm. Jour. and Trans., 1892, 262.

Solidago rugosa.—W. P. Oberhauser collected the plant when in flowering condition and submitted it to analysis with the following results:

	Per cent.
Volatile oil	0.996
Fixed oil	2.210
Wax	0.906
Caoutchouc	1.330
Chlorophyll and resin	4.244
Mucilage	1.900
Dextrin	10.200
Sugar	0.666
Pectin	0.640
Calcium oxalate	0.135
Inulin	0.960
Pararabin	1.000
Lignin	4.690
Incrusting matter	8.580
Cellulin	8.230
Undetermined extractive	9.895
Tannin	2.700
Moisture	9.710
Ash	19.050
Loss	11.958
Total	100.000

A careful search for glucosides and alkaloids in the alcoholic and ethereal extracts of the drug failed to reveal evidence of either.

Considerable quantities of the volatile oils of the flowers and of the leaves were obtained separately by distilling these parts of the plant with water. That from the flowers was a colorless oil having a specific gravity of 0.8486 at 15° C. The oil from the leaves was straw-yellow in color, and had a specific gravity of 0.8502 at 15° C. Both had an odor resembling oil of origanum. They gave evidence by their reactions with iodine and

bromine of containing large proportions of terpene. On careful heating both oils commenced to boil at 130° C.—Am. Jour. Pharm., 1893, 122.

Coniferæ.

Coniferæ of Brazil.—T. Peckolt writes upon Araucaria brasiliana, A. Rich. Lamb, and Podocarpus Lambertii Klotzsch.—Pharm. Rund., 1893, 134.

Coniferæ.—New genus named by Fliche, Pseudo-Araucaria.—Compt. rend., cxvi, 1002.

Abietic Acid.—H. Mach concludes that the true formula of this acid is $C_{19}H_{28}O_2$.—Chem. Zeit., xvii, 436.

Amber—Origin of.—An account of the cells in which amber is secreted, also conditions favoring this secretion.—Nat. Science, July, 1892, 377; Pharm. Jour. and Trans., 1892, 81.

Borneol acetate, a constituent of the oils of *Abies sibirica* and *A. pectinata*. These oils yield fractions, all (from the former oil amounting to 25 per cent.) soluble at 17° C. in 3.6 volumes of 70 per cent. alcohol and having the sp. gr. of 0.979 at 20° C., the saponification equivalent 267.5 and the boiling point 210–220° C. Deprived of water this fraction crystallizes; the crystals melt between 27–28° C. and boil at 210° C.; in alcoholic solution they are laevogyre. By saponification of these crystals both borneol (the laevogyre variety) and acetic acid were identified. As no other ester is present in this oil, it offers the best material for making laevogyre borneol. A qualitatitve test proved the presence of the same ester in *A. pectinata*. The oil of *Pinus canadensis*, reacting very much like the above oils, probably contains this same constituent.—E. Hirschsohn, Pharm. Ztschr. f. Russl., 1892, 593; Am. Jour. Pharm., 1892, 613.

Coniferin.—V. Lippmann has isolated coniferin from Scorzonera hispanica. Vanillin also appeared to be present in small quantities, but could not be separated from other aldehydic substances present.—Ber. d. Chem. Ges., xxv, 3220.

Copal Resins.—Analysis by Ed. Kressel.—Chem. News, 1892, 90, 103.

Dammar—Detection of resin as an adulterant of.—The test depends upon the property of resin to dissolve readily in water of ammonia and upon the addition of acetic acid to reprecipitate; powdered dammar agitated with water of ammonia gives a yellow or red filtrate, which, with acetic acid, remains clear or becomes only slightly opalescent. The ammoniacal filtrate (2 Gm. to 20 C.c.) acidified with acetic acid, gives from a mixture containing 5 per cent. resin a separation of some floccules; 10 per cent. resin yielded a heavy separation; 20 per cent. resin caused the test to form a gelatinous mass so that it could not be filtered.—E. Hirschsohn, Pharm. Ztschr. f. Russl. 1892, 909; Am. Jour. Pharm., 1892, 613.

Pinus maritima—The Tannin of.—By M. Crouzel. This acid belongs

to the group of physiological tannins, giving a green precipitate with ferric salts. The greater part of tanno-metallic precipitates obtained with the acid are remarkably lighter than other similar tannates. It is the same with the gelatinous precipitates.

Colorations obtained by applying various reagents to the aqueous decoction.

1. Brick red with nitric acid.
2. Dirty yellow with sulphuric acid.
3. Red-yellow with hydrochloric acid.
4. Red-yellow with hypochlorites.
5. Reddish-gray with subacetate of lead.
6. No change of color with excess of ammonia, but the cloudy liquid becomes clear.

The peculiar red-yellow coloring matter, found associated with the tannin in the bark, represents tannin in the process of formation. This tannin-producing matter, the author considers, must originate in the cellulose in a similar way doubtless to the glucose, which is always found associated with tannin in plants. It is worthy of remark that the aqueous solution keeps much better than those of most tannins.—Phar. Jour. and Trans., 1892, 11; Bull. des travaux de la Soc. de Pharm. de Bordeaux, May, 1892.

Pectic Acid from Fir-wood.—So-called artificial (oxycellulose). Lindsey and Tollens.—Ann. der Chem., 267, 366; Jour. Chem. Soc., 1892, 827.

Canadine.—C. H. Miller. Verification of reaction reported by Burt.—Apothecary, Aug., 1892.

Russian Turpentine—Valency of the Dextroterpenes in.—Shtschoukareff.—Abstract, Jour. Chem. Soc., 1893, 358.

Resin Oil in Terebinthene—Detection of.—Zune, in Compt. rend., cxiv, 490.

Dextroterpene from Russian Turpentine—Degree of Saturation of the.—A. Shtchoukareff.—Abstract, Jour. Chem. Soc., 1892, 1350.

Turpentine and Camphor—Constitution of.—Collie, in Ber. d. Chem. Ges., xxv, 1108; Jour. Chem. Soc., 1892, 864.

Camphor and Oil of Turpentine and their Derivatives—Chemical Constitution of.—L. Bouveault.—Bull. Soc. Chim. de Paris, 1892, No. 14.

Terebenthenene—Action of Acetic and Formic Acids on.—Bouchardat and Oliviero.—Compt. rend., cxvi, 257.

Alcoholic Ferment of the Pine.—Davalos and Acosta.—Cron. med.-guir. de la Habana, 1892, 337.

Hydrate of Terpinol—Reduction of.—A. Shtchoukareff.—Abstract, Jour. Chem. Soc., 1892, 1351.

Terpineol—Characterization of Crystallised.—Wallach has experimented

upon a crystallized terpineol procured from Schimmel and Co. The melting point was 30°–31°, and after purification 35°. It unites with carbanil, forming crystalline terpenyl-phenylurethane—

$$CO<\begin{matrix}NHC_6H_5\\OC_{10}H_{17}\end{matrix}$$

the melting point and other characters corresponding with those previously described by Wallach. The crystalline terpineol, when heated for an hour with perfectly dry potassium bisulphide, distilled and dried with caustic potash, gave a product boiling principally at 178°–180°, consisting of a hydrocarbon, $C_{10}H_{16}$, which gave dipentene tetrabromide melting at 125°. By treatment with dilute sulphuric acid the terpineol was converted into a mixture of cineol, dipentene, and terpinolene. With stronger acid the terpineol was partly oxidized. Phosphoric acid had a similar effect. Treatment with oxalic acid gave rise to the formation of some terpinene and cineol, but the chief product was terpinolene. Crystalline terpineol is the best material from which to obtain dipentene or terpinolene. To prepare the former, potassium bisulphate is to be used for eliminating water, and oxalic for preparing the latter. The possibility of conveniently preparing tetrabromides of these two hydrocarbons led to the following experiments. It has been shown that limonene tetrabromide treated with alcoholic potash yields a monobromide, $C_{10}H_{15}Br$, and it was probable that dipentene tetrabromide would behave in a similar manner, but it was found to yield only a small quantity of a hydrocarbon and a larger proportion of a heavy bromide, volatilizable with difficulty by steam. Terpinolene tetrabromide behaves quite differently, and the principal product is a hydrocarbon apparently containing cymene.—Phar. Jour. Trans., 1893, 2 ; from Ann. der Chem., cclxxv, 103.

Pine Trees.—The speedy death of pine trees in large cities, has been investigated by the Hygienic Institute of Munich.—Pharm. Post, 1893, 44.

Pix Liquida.—Helfenberger Annalen, 1891 ; Pharm. Centralh., 1892, 438.

The French Resin and Turpentine Industry—Statistics.—Chem. and Drug., 1893, 531.

Turpentinery—A Mississippi.—Illustrated article on the production, collection, etc.—Chem. and Drug., 1893, 394.

Southern Lumber Pines.—B. E. Fernow reports on Pinus palustris, P. cubensis, P. echinata and P. Taeda.—Report of the Chief of the Divis. of Forestry for 1891.—Washington, 1892. (Illustrated.)

Is Thuja an Abortifacient?—A. Tschirch.—Zeits. Oest. Apoth. Ver. 1893, 128, 153.—A review of the constituents and properties of Thuja.

Yew Poison of.—F. J. M. S. Wortley found that taxine, the supposed

poisonous principle in the yew, is contained chiefly or entirely in the male plant.—Pharm. Jour. and Trans., 1892, 184. (See also Chem. and Drug, 1892, 340; 1893, 579.)

Convolvulaceæ.

Bryonia Root—Active Principles of.—Masson (Jour. Pharm. Chim., 1893, 300) gives the following processes for the extraction and purification of the active principles of bryonia root:

The fresh root is cleaned, cut and dried, then coarsely pulverized, and exhausted in the cold with water containing 3 per cent. of hydrochloric acid. The aqueous acid liquid is treated with tannin until no further precipitate forms. The precipitate, which is in the form of a compact mass, is treated with water containing HCl, then with distilled water, dried, pulverized and dissolved in 90 per cent. alcohol; the solution is filtered, decomposed by oxide of zinc, and the resulting mass exhausted with cold distilled water; this upon evaporation yields impure *bryonin*, which is purified by dissolving it in cold distilled water containing five per cent. HCl, and dialyzing until the liquid in the inner vessel yields a residue free from ash, but completely soluble in absolute alcohol. This alcoholic solution is mixed with anhydrous ether; the precipitate washed with ether and dried at 100°. Pure bryonin is white, amorphous, very bitter, soluble in water and alcohol, and insoluble in anhydrous ether and in chloroform. It is dextrogyre, precipitates tannin and ammoniacal plumbic acetate, and has the composition $C_{34}H_{48}O_9$; its alkali compounds are completely insoluble in alcohol.

The root exhausted with water as above, dried, and treated with 90 per cent. alcohol, yields an impure resin which the author calls *bryoresin*. It is purified by triturating with acidulated water, agitating with several portions of boiling water, drying, dissolving in anhydrous ether and evaporating. The resin is soft at 15°, red, amorphous, soluble in alcohol, ether, chloroform, glacial acetic acid, and in alkalies, and from the latter solution is reprecipitated by acids.

Bryonin boiled with dilute sulphuric acid yields a *glucose*, which the author did not succeed in crystallizing, and a yellowish amorphous resin (called *bryogenin*), soluble in alcohol, insoluble in ether.—Am. Jour. Pharm., 1893, 278. (Also, Pharm. Jour. Trans., 1893, 807.)

Convolvulus arvensis, L., called variously palindi, chhatrika, dronpushpi, harankhari and sesai dudhi.—R. P. Banerjee. Ind. Med. Rec., Calcutta, 1893, 7. (See Bull. Pharm., 1893, 274.)

Cucumis utilissimus—Trypsin in.—J. R. Green finds the fruit to contain in the juice and pericarp a proteohydrolytic ferment, capable of dissolving coagulated egg albumin. It is allied to trypsin rather than to the pepsin of the animal organism.—Pharm. Jour. and Trans., 1892, 85; Annals of Botany, 1892, 195.

Ipomœa tuberosa—A Drift Seed of.—W. B. Hemsley.—Record of the seed of this tropical species on the Hebrides.—Am. Bot., 6, 369.

Jalapin.—The examination of the resin of so-called jalap stalks (root of Ipomœa orizabensis, *Ledanois*), has been continued under the supervision of Prof. Poleck, who regards this resin as probably identical with tampicin of Ipomœa simulans, *Hanbury*, and confirms its identity with scammonin. The formula, $C_{34}H_{56}O_{16}$, determined by W. Mayer in 1855, is confirmed; also the various derivatives, except jalapinol, which had also been noticed by Samelson in 1883, but which could not be isolated by Poleck. Jalapic acid is $H_2C_{17}H_{28}O_9$, and jalapinolic acid $HC_{16}H_{29}O_3$.—Zeitschr. Oest. Apoth. Ver., 1892, 391, 423 and 447.

The name *jalapin* should be discarded in favor of *orizabin*, the former name being improper and misleading.—Am. Jour. Pharm., 1892, 465.

Turpethin and Scammonin.—N. Kroner (Pharm. Zeitschr. f. Russ., 1892, 769; Chem. Zeit. (Rep.) 1893, 9) observes that the glucosides, turpethin, $C_{76}H_{128}O_{36}$, and scammonin, from scammony root, are not identical.

Turpethin occurs as an amorphous, light yellow mass, which has a very irritating effect on the mucous membranes of the nose and mouth.

It is insoluble in ether and benzol, sparingly soluble in chloroform, but more readily in alcohol and glacial acetic acid. On oxidation with nitric acid it yields sebacic, isobutyric, carbonic and oxalic acids; while on oxidation with potassium permanganate, oxalic, isobutyric and turpetholic ($C_{16}H_{32}O_4$) acids result.

Scammony and Scammony Resin.—W. J. Smythe examined five commercial samples with the following results:

Numbers.	Resin Soluble in Alcohol.	Resin Soluble in Ether.	Ash.	Specimen.
I.	46.6 per cent.	44.4 per cent.	0.7 per cent.	Aleppo Scammony.
II.	71.4 "	69. "	15. "	Virgin "
III.	93.6 "	88.8 "	.....	Resin "
IV.	95.8 "	92.7 "	.....	" "
V.	90. "	.....	.....	" "

—Meyer Bros'. Drug., 1892, 229.

Glucosides of the Convolvulaceæ—Studies upon the.—K. Nicolai has examined the constituents of Convolvulus Scammonia and Ipomœa Turpethum, A. Brown.—Pharm. Post, 1892, 1171.

Coriariaceæ.

Redoul (*Folia Coriariæ*).—T. F. Hanausek considers the chemistry and pharmacognosy of the leaves of Coriaria myrtifolia. For proving the presence of *coriamyrtin* in the leaves microscopically, the author found iodine

in potassium iodide an excellent reagent. A cross section of the leaves treated with the iodo-potassium iodide reagent turns almost black on account of the black precipitate formed. The excess of the reagent is removed with blotting paper and the cross section suspended in strong alcohol. The section becomes lighter colored, so that the green again predominates. If a drop of a concentrated solution of sodium hydrate be now applied to the cross section, an immediate purple violet color results, with separation of deep-red particles. The progress of change in color from the outside to the interior of the leaf is readily observed. In 10 to 15 minutes the color disappears entirely and a yellow precipitate remains. The *coriamyrtin* is apparently contained in all parts of the mesophyll. The paper is illustrated.—Pharm. Post, 1892, 1333.

Cornaceæ.

Cornus Florida.—Garden, xliii, 152. Illustrated article.

Alangium Lamarckii Thwaites.—According to Scheriff the alkaloid *alangin*, which occurs in the bark of the stem and root, is a strong and safe emetic in doses of 3.0 Gm. and in small doses useful as a febrifuge and anti-dysenteric. The alkaloid, according to B. Schuchardt, is very bitter and not crystallizable. It is soluble in alcohol, chloroform and acetic ether, but is insoluble in water.—Pharm. Zeit., 1893, 17; Zeits. Oest. Apoth. Ver., 1893, 138.

Garrya Fremontii or California Fever Bush.—G. C. Smith.—Nashville, J. M. and S., 1892, 198.

Viburnum prunifolium.—Joseph. Deutsche. Med. Zeit., Berl., 1893, 447.

Cruciferæ.

Lepidium sativum and *Raphanus sativus* have been grown by P. Lesage and watered with solution of sodium chloride. Such plants produced modifications closely analogous to those observed in the same plants growing near the sea coast, and the stems and roots contained considerable amounts of salt.—Compt. rend., cxiv, 143; Am. Jour. Pharm., 1892, 366.

Shepherd's Purse.—The styptic principle in Shepherd's Purse has not been definitely determined, so that for use the juice of the fresh herb is still considered the most reliable preparation of this valuable drug. Von Oefell (Rundschau) finds that the preserved juice (so-called fluid extract) is somewhat impaired by being kept for a long time, particularly when stored in cold rooms, when it becomes slightly turbid and deposits a pulverulent sediment. Such a preparation must not be filtered, but should be rendered clear by warming to about 100° F. To prevent this precipitation in a measure, this preparation should not contain more than 10 per cent. of alcohol and glycerin.—West. Drug., 1892, 342.

Thiosinamine, or allyl sulphocarbamide, $CS\,NH_2\,NHC_3H_5$, a compound

known for many years, has been used very successfully during a two years' trial by Dr. v. Hebra in the treatment of lupus, and has also been found to exert a powerful and favorable action in reducing glandular tumors. Thiosinamine is made from volatile oil of mustard (allylisosulphocyanate), by treatment with ammonia. The crystals have a bitter taste and a faint odor resembling oil of mustard, and are easily soluble in hot water, alcohol and ether. Injections of a 15 per cent. (alcoholic) solution form the method of using; immediately after the injection a burning pain is felt, which, however, is of short duration.—Zeitschr. Oest. Apoth. Ver., 1892, 695.

Cycadaceæ.

Cycadaceæ of Brazil.—T. Peckolt contributes to our knowledge of the Cycas revoluta, L.—Pharm. Rund., 1893, 133.

Cyclanthaceæ.

Cyclanthaceæ of Brazil.—T. Peckolt considers Carludovica palmata, S. et T. and C. divergens Dr.—Pharm. Rund., 1893, 134.

Cupuliferæ.

Birch Bark—Products of the dry Distillation.—Kuriloff. Birch bark on dry distillation, gives, besides tar, an aqueous solution containing 1.25 per cent. of acetic acid. The only volatile base is ammonia, which is present in the solution to the amount of 0.73 per cent.—Abstract, Jour. Chem. Soc., 1893, 131.

Chestnut—Lilac Color from Extract of.—Mr. Palmer has obtained, but not yet separated, the body giving this color from the oxidized extracts.—Pharm. Record, 1893, 9.

The Oaks of North America.—Hardwood, Vol. II, No. 8.

Dioscoreaceæ.

Dioscorea Species—On the Tubers of.—J. M. Maisch finds that the Dioscorea Batatas, Decaisne, will survive our winters, the axillary tubers of which were analyzed by F. W. Meinke. (See p. 648.)

Messrs. Heckel and Schlagdenhauffen have recently made a study (*Revue des Sciences nat. appl.*, March, 1892) of the tubers of Dioscorea bulbifera, Linné, and ascertained that in the Gaboon country of tropical Africa, the aërial tubers are looked upon as being decidedly poisonous, while in other French colonies they are considered inoffensive. Working with the aërial tubers procured from the Gaboon country, they separated with petroleum benzin some wax and chlorophyll, and then exhausted the residue with alcohol; this extract on being treated with water left some resin behind, while yellow coloring matter, saccharose and a bitter principle went into solution; this solution injected subcutaneously proved poisonous to frogs,

and was shown to contain a glucoside. The authors found the underground tubers to be entirely free from this toxic principle.

It is of interest to note the fact that Mr. Meinke's investigation has also shown the presence of a glucoside in the aërial tubers of the Chinese yam, and it remains to be determined whether it also possesses poisonous properties. With the exception of the two species mentioned, these bitter principles do not appear to have been subjected to chemical research; in fact, but very few analyses of yam have been placed on record. The earliest one found by me was published in 1802, in Scherer's Journal on *Dioscorea sativa*, by Juersen (I); one in 1852 by Payen, on *D. alata* in *Compt. rend.* xxxv (II); one credited to Boussingault, species not mentioned, in *Jahresbericht*, 1855 (III); one by Frémy on the tuberous roots of *D. Batatas* in *Compt. rend.* xl (IV); those by Heckel and Schlagdenhauffen mentioned above on the subterraneous (V) and on the aërial (VI) tubers of *D. bulbifera*, and finally the present one by Meinke on the aërial tubers of *D. Batatas* (VII). For convenience of comparison the results may be tabulated as follows:

	I.	II.	III.	IV.	V.	VI.	VII.
Water	67.58	77.05	82.6	79.3	69.234	67.445	61.62
Salts	—	1.90	1.3	1.1	0.3076	1.013	1.62
Cellulose	6.51	1.45	0.4	1.0	18.4113		
Starch	22.66	16.76	13.1	16.0	3.6950		
Mucilage	2.94				—		
Sugar	0.26	—		1.1	16.9223	31.542	36.76
Fat	—	0.30	0.2		0.1584		
Resin	0.05	—	—	—	—		
Albuminoids	—	2.54	2.4	1.5	1.2750		

The detailed results of (VI) calculated for the anhydrous substance were as follows: Wax and chlorophyll, 0.70; saccharose, yellow color and bitter toxic principle, 3.30; resinous matter, 0.50; albuminoids, 5.31; starch, 52.22; cellulose and lignin, 34.81; fixed salts, 3.16.—Am. Jour. Pharm., 1893, 125.

——— *Analysis of.*—F. W. Meinke (Ibid., 123) examined the axillary tubers furnished by Prof. Maisch. He obtained reaction for a glucoside which was not further investigated. The results of his analysis are tabulated as follows:

Alcoholic extract	Glucoside, undetermined amount.		
	Fat	.38	
	Wax	.02	
			.40
Aqueous extract	Mucilage	.20	
	Dextrin	.20	
	Saccharose	.36	
	Glucose	.72	
	Undetermined organic matter	2.00	
			3.48

Alkaline aqueous extract	Pectin and albumen	3.00	
	Undetermined organic matter	3.40	
			6.40
Acidulated aqueous extract	Calcium oxalate and pararabin	2.00	
	Undetermined organic matter	2.00	
			4.00
Boiling aqueous extract	Starch	1.64	
	Undetermined organic matter	10.80	
			12.44
Chlorine water	Lignin		.12
Residue	Cellulin		3.64
Original drug	Moisture		61.62
	Ash		1.62
Total			93.72
Loss			6.28
			100.00

Ericaceæ.

Andromeda Manana.—A. W. Dowd made a proximate analysis of the leaves, with the following results:

	Per Cent.	
Moisture		2.16
Ash		5.25
Extracted by petroleum ether:		
Volatile oil	.035	
Fat	0.320	2.58
Wax and caoutchouc	2.226	
" Stronger ether		3.82
" Absolute alcohol		18.70
" Water:		
Mucilage	1.35	
Dextrin	2.98	
Glucose	3.83	12.28
Undetermined	4.12	
" Diluted alkali:		
Pectin and albuminoids	2.73	8.55
Undetermined	5.82	
" Acidulated water		4.38
" Boiling water:		
Chiefly starch		1.99
Lignin		3.18
Incrusting matter		5.86
Cellulose		31.25
Total		100.00

The ethereal extract consisted largely of chlorophyll and resin.

The alcoholic extract contained red coloring matter, tannin and resin. It also contained a sweet principle of a glucosidal character.

This was probably the *andromedotoxin*. He did not succeed in obtaining this compound pure.—Am. Jour. Pharm., 1892, 458.

"Pinguica"—Short Account of—Murello.—Description, illustration and notes on the properties of Arctostaphylos pungens, locally known in Mexico by the name of "Pinguica."—El Estudio 4, 234.

Extract of Vaccinium Myrtillus.—R. Weil has used this successfully in diabetes.—The Am. Therap., 1893, 234.

Vaccinium Vitis-idœa in Rheumatism—Decoction of.—In 1887, Dr. Sanine proposed the use of the cowberry plant, *Vaccinium Vitis-idœa* for rheumatism. Following this, Dr. Herman administered the decoction with good success to three patients, one being an old man who had suffered for three and one-half years with muscular articular rheumatism.

Dr. Smirnoff (Vratch, through Bull. de Thérapeut., 1892, p. 470), used a decoction of the whole plant in the proportion of 30–60 Gm. to 500 C.c. water. The decoction is dark in color, not clear, has a bitter taste and neutral reaction. Nine patients were treated; with seven a cure was effected, with two no effect whatever was produced. The treatment lasted from three weeks to three months.—Am. Jour. Pharm., 1892, 515.

Cranberries in Rheumatism.—J. Hermann (Wiener med. Presse) speaks very highly of cranberries in the treatment of rheumatism, both acute and chronic.—Drug. Circ., 1892, 232.

Cranberries, it is stated by a German writer, are occasionally fraudulently mixed with service berries, the fruit of the European mountain ash. Service berries contain malic acid besides other indifferent constituents of fruits. They are considered mildly astringent, diuretic, anti-scorbutic, anti-dysenteric, and even emmenagogue, and as such are sometimes called for by country folk.—West Drug., 1892, 462.

Euphorbiacæ.

Two Euphorbiacæ—The Poisonous Principle of.—A. Siegel concludes that the poisonous principle of the seeds of Jatropha Curcas is different from the ricin of Castor Oil Seeds.—Pharm. Post., 1893, 293.

Cassava—Some of the Products of.—E. E. Ewell and H. W. Wiley. Analyses of Jatropha Manihot or Aipi, show it to be a plant of high economic value.—Am. Chem. Jour., 1893, 285.

Euphorbia antiquorum, Linné.—J. Santos Fernandez of Havana (Revista de Cienc. med., April) has observed sixteen cases of inflammation of the cornea and conjunctiva resulting from having come into contact with the milk juice of this plant; the appearance of the organs was similar to that produced by burned lime or boiling water. The treatment was similar to that followed ordinarily for this kind of lesions. The plant is originally indigenous to India, where it and its milk juice are employed medicinally.—Am. Jour. Pharm., 1892, 468.

Euphorbia Huanchahana—Clinical Experiments with.—D. Espejo, Crón. Méd., Lima, 1893, 43–53.

Castor Bean in India.—Cultivation of castor-oil plant.—Bull. Pharm., 1893, 271.

Castor oil plant is avoided by mosquitoes. In Egypt it is planted about houses to drive them away.—Chem. and Drug., 1893, 425.

Detection of Croton and Castor Oil Seeds.—Castor oil and croton seeds remain unbleached when treated with a solution of sodium hypochlorite. Bleaching powder has a similar effect. If suspected feeding stuff be first digested with acid and alkali and then subjected to the action of bleaching powder for a few hours, any castor oil seed or croton seed will remain black amongst the bleached mass. The microscopical examination of the transverse sections through the testa of croton seeds reveals on the outermost edge a distinct thickening of each bundle of the fibres, which is not present in the testa of castor oil seeds.—The Analyst, 17, 195, 121; Phar. Jour. Trans., 1892, 41.

Jatropha Curcas and Croton Tiglium — Toxic Constituents of.—R. Kobert, in Bull. Pharm., 1893, 200, considers *Curcin; Curcas Oil*, the toxic action of which is more powerful than that of castor oil, but feebler than that of croton oil: *crotonoleic acid*, and the active principle of the root of Jatropha macrorrhiza, Benth.

Jatropha Curcas.—The seed constitutents are as follows: Water 7.2 per cent.; ash, 10.2 per cent.; oil, 33.86 per cent.; sugar, coloring matter, cellulose, 47.83 per cent.; albuminoids, 1.71 per cent. The pale yellow oil extracted with ether uniformly deposited albuminous matters upon boiling; the iodine absorption was 130; saponification figure 231, and the volatile acids (Reichert-Meissl 2.5 gram) 0.5. Palmitic and myristic acids along with an acid having the formula $C_{17}H_{32}O_3$ and called curcanolic acid, and a resinous body were detected. Experiments having for their object the isolation of the active principle of the seed failed, but it was found that water was its best solvent and removed it from both embryo and cotyledons (after the removal of the oil); heating this aqueous solution to 60° C. and the addition of any of the albuminoid precipitant destroyed the activity; it, therefore, differs sharply from ricin, but resembles the poisonous albuminoid of the spider and the mushroom, Amanita phalloides, Fr.; the name *curcin* is proposed for it. Physiological experiments with the root of *Jatropha macrorrhiza*, Benth., establish purgative properties, but owing to the poisonous nature of the root the greatest caution must be exercised in its use.—August Siegel (Dissert. Dorpat) Pharm. Ztschr. f. Russl., 1893, 242; Am. Jour. Pharm., 1893, 335.

Jatropa Purgans? (La Jicamilla).—E. Torres.—El Estudio, Mexico, 1891–92, 227.

A False Kamala.—Henry G. Greenish examined five sample lots from

Bombay, and found it to be carelessly collected and badly preserved safflower, mixed with much extraneous matter and reduced to a coarse powder.—Pharm. Jour. Trans., 1893, 745.

Kamala—Ash of.—In a sample recently received from J. H. Maiden, which was collected in the northeastern portion of New South Wales, Professor Flückiger found only 3.35 per cent. ash. Climatic conditions apparently do not cause an increase in the amount of ash, as samples from northwestern India, central India, Java and New South Wales, contained about three per cent. or less.—Archiv der Pharm., 1892, 249; Am. Jour. Pharm., 1892, 410.

——— A further contribution by T. Waage in Pharm. Centralh., 1892, 551.

Phyllanthus Niruri.—Merck's Ber., 1892; Pharm. Post, 1893, 96.

Filices.

Aspidium Filix-Mas—The Ethereal Oil of the Rhizome of.—A. Ehrenberg.—Archiv. der Pharm., 1893, 345.

Male Fern—Toxicology of.—Drs. Katayama and Okamoto give details of a number of cases in which the extract of male fern had been administered to patients who subsequently developed symptoms of poisoning.—Sei-i-Kwai (Med. Jour.), xi., 101; Pharm. Jour. and Trans., 1892, 182.

The Activity of Male Fern has been ascribed by Poulson to *filicic acid*, which also is the poisonous constituent (Amer. Jour. Pharm., 1891, 288 and 487). Prof. R. Kobert now calls attention to the fact that the activity of the male fern is partly due to volatile oil, and that the removal of the fixed oil would also include the removal of the volatile oil. One of the reasons for this statement is that the pure filicic acid given in very large doses without the addition of the oil did not accomplish what a much smaller dose of the acid mixed intimately with the fixed and volatile oils of filix accomplished.—Pharm. Post, 1892, 1325; Am. Jour. Pharm., 1893, 135.

Fumariaceæ.

Corydalis—Alkaloids of.—See Alkaloids.

Fungi.

Fungi.—J. B. Smith.—Med. Times and Hosp. Gaz., Lond., 1893, 174, 189.

Ergot—The Pharmacognosy of.—A. R. L. Dohme.—Pharm. Record, 1893, 99 and 135.

——— *The Present Pharmacological Position of.*—Grünfeld.—Pharm. Post, 1892, 648, 673, etc.

——— *Pharmacological Notes on.*—A. Grünfeld, in Kobert's reports

from the Pharmacological Institute at Dorpat, has published a valuable treatise on the action of ergot of rye and its constituents. Abstract in West. Drug., 1892, 410; Pharm. Rund., 1892, 262.

Ergot.—A Contribution to the Study of—L. Pardailhé.—Montpelier, 1892. Thesis, No. 514.

——— *A Memoir on the Chemical History of.*—Van Engelen and Dutrannoit.—Jour. de Med. Chir. et Pharmacol. Annales, Brux., 1892, 153.

Gentianaceæ.

Menyanthes trifoliata and Erythræa Centaurium.—A contribution on the constituents of.—K. Lendrich, Berlin; G. Schenck.

An Ophelia Plant.—S. Ojima.—Ogata Biogen Ijikwai Ho, Tokio, 1892, 29–40.

Glumaceæ.

Northern Ohio—Glumaceæ of.—E. Claassen in Pharm. Rund., 1893, 33.

Gramineæ.

Corn Oil.—A yellow liquid obtained from corn and used in making paint varnish or soap.—Pharm. Review, 1892, 131.

Lolium temulentum—Constituents of.—An analysis of the seeds of this plant by Hofmeister corrects the results announced by Dr. P. Antze (See Proc. 1892, 613). The volatile alkaloid "*loliine*" was found to be impure ammonia; the so called "*temulentine*" was also found to be a mixture containing some of the narcotic principle which Hofmeister isolated and called *temuline*; "*temulentic acid*" is at present considered by Hofmeister to be a mixture of the acid tartrates of ammonium and potassium. Hofmeister's *temuline* is not crystallizable, is very likely a pyridine derivative, is soluble in water, has an alkaline reaction, and eagerly absorbs carbonic oxide. The crystallized hydrochlorate has the formula $C_7H_{12}N_2O.2HCl$. The amount of temuline present in the seeds is approximately 0.06 per cent. The author also determined the presence of an acid containing nitrogen, and of an uncrystallizable alkaloidal body; by decomposing the platinum double salt of the latter, a mixture of temuline hydrochlorate and an uncrystallizable syrupy body were obtained. Physiological experiments established that temuline is a peculiar nerve poison, causing stupor and paralytic weakness.—(Arch. f. exp. Path.) Apotheker Ztg., 1892, 544.

Maize—Proteids of.—R. H. Chittenden and T. B. Osborne have resolved the proteid matter by fractional heat coagulation into 3 distinct globulins. The first globulin approximates closely in composition to animal myosin; but the bulk of it coagulates at 70°, a temperature markedly different from the coagulation point of the myosin. It also resembles vegetable myosin obtained from papaw juice, and may thus be called *maize-myosin*. The

second globulin, *maize vitellin*, approximates closely in composition to that of the phytovitellin of pumpkin seeds. It contains less sulphur than myosin, and is perhaps as much akin to heteroalbumose as to the true globulins. Maize-vitellin is distinguished from maize myosin by its solubility in weak, cold, saline solutions, and by its tendency to separate in spheroidal form from sodium chloride solutions.

The third globulin, which is characterized by its solubility in dilute solutions of salts other than chlorides, and its insolubility in water, is obtained by long-continued dialysis of the solutions from which the other globulins have already separated. It was not observed in the preliminary experiments, owing to the slow rate at which ammonium sulphate and the alkaline phosphates diffuse. This globulin has a distinct composition from the myosin and vitellin, and is completely coagulated at 62°.

Various other substances isolated during the investigation were probably formed from the solutions by the incidental treatment, and do not exist as such in maize. An aqueous or sodium chloride extract of maize meal yields, after the three globulins and the soluble salts have been removed by dialysis, two albumins and a proteid soluble in alcohol (proteose). The maize meal, after extraction with water, contains another proteid, *zein or maize fibrin*.—Amer. Chem. J., 13. 529–552, and 14, 20–40; reprinted from Jour. Chem. Soc., June, 1892, p. 746; Am. Jour. Pharm., 1892, 428–432.

Maize Oil.—J. C. Smith examined a sample of the oil which is believed to be genuine. Its properties would seem to render it suitable for several technical applications.

The bromine and iodine absorptions were as follows:

	Per cent.
Bromine absorption	66.50
Iodine absorption	122.90
Iodine absorption (calculated; Br. absorption × $\frac{126.7}{80}$)	105.50

It was observed that when the bromine solution remained in contact with the oil for more than fifteen minutes, the results obtained were somewhat higher, and did not agree among themselves, owing, no doubt, to a secondary oxidizing action.

On saponification with alcoholic potash, the total KOH absorbed was 19.34 per cent., which gives a "saponification equivalent" of 290.07. The oil was readily saponified in the cold.

Specimens of potash and soda soaps were prepared, and both of these proved to be of good quality, being light in color, and readily and completely soluble in water. The soda soap is distinctly the harder of the two, but the potash soap is harder than the "soft" soaps. Soap-making, therefore, is a use to which the oil might with advantage be put. The ease with which it saponifies, also, might make it useful to mix with other oils

to accelerate their saponification. As a lubricant it might in certain cases be applicable, its low acidity, and its small tendency to deposit solid matter or to "gum," being properties that recommend it for this purpose. The oil dissolves readily in acetone, and more sparingly in alcohol or glacial acetic acid.

The viscosity was determined roughly by observing the time of flow of 5 C.c. of the oil through a burette with a capillary point, and comparing the results with standard oils.

$t = 18°$ to $19°$ C.

	Maize.	Olive.	Colza.	Mineral "901."
Specific gravity	0.924	0.918	0.915	0.910
Time of flow	177.3″	244.5″	290.0″	243.5″
Viscosity.	61.1	84.3	100	83.9
(Colza=100) (water=1)	25.7	35.4	42.0	35.2

Maize oil thus possesses a striking individuality. In general it may be said that in properties it is somewhat akin to cotton-seed oil. At the same time there are differences between them which are very marked.—Abstract from the Jour. Soc. Chem. Industry, June 30, 1892; from Phar. Jour. and Trans., July 16, 47; Am. Jour. Pharm., 1892, 433–435.

Rice Culture in Japan, Mexico and the United States, from the Hygienic Point of View.—A. S. Ashmead.—Science, 1892, 57.

Black Rice.—(Oryza glutinosa?)—Prof. Church by analysis finds that it approaches the nutrient ratio of a complete food more nearly than do the ordinary varieties of Indian rice.—Kew Bull., 70, 232.

Rye—Intoxicating.—M. Prillieux found in the French specimens the presence of a fungus in the interior of the grains, the mycelium having permeated the external layer of albumen, whilst at certain points the starch grains appeared to have been affected by some diastasic secretion in the organism. (Rev. Inter. des Falsifications)—Pharm. Jour. and Trans., 1892, 6.

Zea May—Blue Corn.—T. Waage, in Pharm. Centralh., 1893, 73.

Gnetaceæ.

Gnetaceæ of Brazil.—T. Peckolt coonsiders the medicinal properties of Ephedra Ariandra, Tll., and Gnetum Leyboldi, Tal.—Pharm. Rund., 1893, 136.

Granataceæ.

Granati Radicis Cortex.—An alkaloid pseudopelletierin. Merck in Ber. d. Chem. Ges., xxv, 1601; Pharm. Centralh., 1892, 464.

Guttiferæ.

Garcinia Collina, Vieil—Gum Resin of.—Analysis by Heckel and Schlagdenhauffen in Rép. de Pharm., 1893, 193.

Heckel and Schlagdenhauffen describe this New Caledonian product as comparable to the gamboge from *G. morella,* except that its color tends more to orange. It exudes as a yellowish latex from incisions in the bark of the tree, and dissolves easily in chloroform, carbon bisulphide, alcohol, amylic alcohol, ether, and petroleum ether. On analysis it yielded a white crystalline substance, having a percentage composition of C, 71.993; H, 7.911; O, 20.096. This was soluble in the same media as the gum-resin, though less so in the two etheis. The crystals had a melting point of 235°, and decomposed if heated beyond that point, crystals of pyrocatechin being found among the products of decomposition. The resin separated from the natural product behaved like a tannin in colored solution, when dissolved in alcohol. Compared with ordinary gamboge, its reactions were found to be very similar, whilst both showed a great analogy to gallo-tannic acid, although they differed much from it as regards solubility. The chief points of difference between the new gum-resin and other varieties of gamboge are the production of pyrocatechin as a decomposition product and the existence of the crystalline compound briefly described above. The following table shows the results obtained by acting upon (α) the gum-resin of *G. collina,* (β) that of *G. morella,* and (γ, δ) two other kinds of gamboge, with petroleum ether, alcohol, and water successively:

Gum resin.	Resin, sol. in petrol ether.	Resin and sugar, sol. in alchohol.	Gum, sol. in water.	Woody matter, by difference.	Water, by desiccation.
α	73.1	1.8	15.0	5.8	4.3
β	72.9	nil	19.4	4.3	undet.
γ	72.4	"	21.8	nil	4.8
δ	71.6	"	24.0	"	4.8

From the analogy in composition, therefore, the authors consider that the product of *G. collina* should exhibit purgative properties similar to those of the other gum-resins.

Garcinia indica, Chois.—C. Hartwick calls attention to the fat yielded by the seeds of this plant. The author has made a microscopical examination of the seeds.—Chem. Zeit., 1892, 1031.

Hamamelaceæ.

Storax—History and Preparation.—Pharm. Era, 1892, 135.

Hydrocharidaceæ.

Anacharis alsinastrum.—A plant to suppress malaria. Brandes of

Hanover calls attention to the properties of the Anacharis alsinastrum, a water plant which has hitherto been considered an unmitigated plague choking up rivers, and altogether useless. He has remarked that in the district where he lives, and where malaria and diarrhœa yearly appeared in a sporadic or epidemic form, these diseases have gradually decreased since the Anacharis alsinastrum began to infest the neighboring rivers and marshes, and since four years have totally disappeared. The above-named water plant nourishes itself on decayed vegetable matter, and grows with incredible rapidity. It thus destroys the germs which produce malaria and diarrhœa; and besides, its presence obliges the frequent cleansing of standing waters—a measure beneficial to health. Dr. Brandes therefore proposes that the experiment should be tried of planting the Anacharis in marshy districts. It is also useful in protecting the young fish, and affords an excellent fertilizer. The plant came originally from Canada, whence it was taken to England, and thence to Germany about 1840.—Drug. Circ., 1893, 59.

Irideæ.

Irideæ of Brazil—Official.—T. Peckolt contributes to the materia medica of the following: Cipura paludosa, Alophia Sellourana, Cypella coerulea, C. Northiana, Polia Sonariensis, Lansbergia cathartica, L. purgans, L. Caracasana and Sisyrinchium galaxoides are noted.—Pharm. Rund., 1892, 132.

Saffron with Wheat Flour—The Adulteration of.—Herz and Hanausek. To decrease the loss occasioned by drying, the stigmas are dusted with a fine powder, capable itself of absorbing moisture and coloring matter; mineral powders being so readily detected, flour is used as a substance cheaply and conveniently obtainable, which is a good absorbent, and, what is more to the point, something that no one looks for. The microscopic examination for flour must be conducted with care, since the strong coloring power of the coloring matter notably interferes with the recognition of the adulteration; the best method for detecting the starch granules consists in suspending the sample in the finest olive oil.—(Ztschr. f. Nahrungsm.-Unters. Hyg. u. Waarenk.) Pharm. Ztg., 1893, 40; Am. Jour. Pharm., 1893, 134.

Saffron, its Substitutes and Adulterations.—E. Vinassa gives an account of his investigations of true saffron and its possible adulterations. His researches were extended to specimens of saffron, marigold, safflower, red saunders, corn silk, arnica flowers, turmeric, campechy chips, pomegranate flowers, meat fibre, etc., together with sixteen varieties of artificial dyes, chiefly aniline colors. The various specimens were examined in a pure state, as well as in mixtures in different proportions, and altogether the work offers the most comprehensive contribution to the literature of the subject ever presented.

A number of very complete valuable tables are published by the author in connection with his treatise, showing the results obtained by him in the examination of a very large number of various mixtures, and no less than 62 specimens of commercial saffron. An account is also given of the color imparted by shaking with ether, chloroform, carbon bisulphide, amylic alcohol, mercuric chloride with solution of potassa, and animal charcoal. —Archiv. der Pharm., 1892, 353.

Krameraceæ.

Krameria—Constituents of.—G. Ohmeyer. Leipzig: G. Fock. Krameria cistoidea and Gunnera chilensis; pacul, pangue.—F. Vallejo Ostén. Rev. med. de Chile, 1892, 501.

Labiatæ.

Labiatæ—On Certain Californian.—E. L. Greene.—Pittonia, 2, 233.

Stinging Hairs—A Labiate Plant with.—By R. Baron. On the north coast of Madagascar. It proves to be an undescribed species of *Achyrospermum.*—Kew Bull., 66, 150; Phar. Jour. and Trans., 1892, 85.

Majorana.—Examination of German and French.—G. Rupp in Zeitschr. f. Angew. Chem., 1892, 681.

"Marv."—On the Persian Drug.—O. Stapf finds that the supposed Phyllanthus seeds of Dymock agree perfectly with the nutlets of a number of species of Salvia.—Phar. Jour. Trans., 1893, 745.

Teucrin is the name given by Professor von Mosetig-Moorhof to an extract of the plant *Teucrium Scordium*, found throughout central Germany, and which has been known since the earliest times as an excitant and antiferment. The remedy is prepared by making a decoction of the dried plant, concentrating to honey consistency, and purifying by addition of alcohol; the filtered solution is evaporated until a specific gravity of 1.15 is obtained, when the extract is sterilized and hermetically sealed in glass vials holding three grams. In appearance it is a dark-brown liquid, having a characteristic odor; it is acid in reaction, ten grams requiring 11.4 C.c. $\frac{n}{10}$ alkali for neutralization; total solid, 20.80 per cent., including 4.60 per cent. ash. Other species of Teucrium, also Pulegium vulgare, possess the same medicinal virtue, but in a lesser degree. Teucrin has been found a valuable remedy in the treatment of the fungoid local diseases, abscesses: it is used hypodermically, and acts by causing increased blood circulation in the diseased part.—(Wiener. Med. Bl.) Pharm. Centralh., 1893, 89; Am. Jour. Pharm., 1893, 171.

LAURINEÆ.

Laurineæ of India.—An account of the medicinal properties of Tetranthera laurifolia, T. monopetala, Roxb., T. citrata, T. Myrrha, T. Cubeba, T. glabraria.—Chem. Zeit.; Pharm. Post, 1893, 197.

Acid Lapachic.—By S. C. Hooker. The author has investigated the constitution of lapachic acid (lapachol) and its derivatives, operating on material obtained chiefly from the Surinam greenheart. The acid is found in the lapacho tree in a crystalline state. Hooker shows that the view held by Paternó (1882) that lapachol was a homonucleal amylenehydroxynaphthaquinone was correct, though based on a wrong reason. Lapachone being derived from β- rather than α-naphthaquinone as Paterus supposed, it is proposed to term this product β-lapachone to distinguish it from α-lapachone, a true α-quinone.—Proc. Chem. Soc., 113, 125; Pharm. Jour. and Trans., 1892, 3.

Caparrapi Balsam.—A description of Laurus giganteus, with an account of obtaining this balsam and of its medicinal properties.—Pharm. Jour. Trans., 1893, 1046.

Tetranthera laurifolia, Jacq.—Contribution to the materia medica, in Chem. Zeit., 1893, 500.

Artificial Camphor.—Terebenthen, obtained in the distillation of turpentine, is saturated with hydrochloric acid gas; the two isomers produced, one solid, the other liquid, are separated, as only the former is available for the production of camphor. This is then mixed with an alkaline carbonate, and heated in a still to about 120° C. to produce and vaporize the hydrocarbon, camphene, $C_{10}H_{16}$; in the form of vapor, camphene is acted upon by ozone or ozonized air, whereby the hydrocarbon takes up oxygen, forming camphor, $C_{10}H_{16}O$. The camphor is compressed, melted, or subjected to distillation.—(German Patent) Pharm. Ztg, 1892, 756; Am. Jour. Pharm., 1893, 69.

Preparation of Camphor by Means of Ozone.—M. de Mare utilizes the oxidizing properties of ozone or ozonized air for the preparation of camphor from camphene. The camphene is distilled, the receiver heated, and on submitting it to ozonized air, the camphor begins immediately to sublime on the sides of the cylinder. The camphor thus obtained is identical with the high-priced Japan article.—Lumière électrique; Am. Jour. Pharm., 1893, 174.

Powdered Camphor, prepared as follows, will not again conglomerate (Der Pharmaceut). Dissolve camphor in one and a half parts of alcohol, precipitated by the addition of four parts of water. Collect the precipitate and wash with an abundance of water and dry. By keeping account of the quantity of camphor used, the quantity left in the diluted alcohol can be calculated and this solution used for making tincture, etc.—Amer. Drug., 1892, 94.

Camphor for Hypodermic Injection is dissolved by Dr. Rosauer in warm paraffin oil.—Zeitschr. f. Ther.; Am. Jour. Pharm., 1892, 465.

Camphor—Manufacture of.—Paint, Oil and Drug Rev.; Bull. Pharm., 1893, 39.

The Japanese Camphor Trade.—Pharm. Jour. Trans., 1892, 482; from U. S. Consular Report at Osaka.

Camphor Growing in Formosa.—How to kill an industry.—Chem. and Drug., 1893, 491.

Production of Camphor in Formosa.—F. Roques, in Jour. Pharm. Chem., 1893, 594.

Manufacturing Camphor in Japan.—Sketch of the Process in Amer. Drug., 1893, 198; from Tokyo Sei-i-Kwai Med. Jour.

Camphor in Japan—Sketch of the Process of Manufacturing.—Sei-i-Kwai M. J., Tokyo, 1892, 220.

Light Oil Camphor in Painting.—G. Bornemann.—Amer. Drug., 1893, 326; from Tech. Mitth. f. Maleri.

Camphor.—G. Oddo.—Gaz. xxiii, 70, 85; Jour. Chem. Soc., 1893, 422.

Isomeride of Camphor—Synthesis of a Structural.—E. Knoevenagel.—Ber. d. Chem. Ges., xxvi, 1085.

Heat of Combustion of Camphor.—Berthelot.—Compt. rend., cxv, 762.

Camphor and Fenchone Series—Studies in the.—O. Wallach.—Ann. der Chem., 1892, 269, 326; Jour. Chem. Soc., 1892, 1236.

Camphor Group.—U. Alvisi.—Abstract, Jour. Chem. Soc., 1892, 1343.

Camphor into Camphoric Acid—Novel Transformation of.—Angeli finds that nitrosocamphor is readily converted into the imide of camphoric acid when it is heated on the water-bath for five minutes with concentrated sulphuric acid (10 parts).—Ber. d. Chem. Ges., xxvi, 58.

——— O. Manasse confirms Angeli's results.—Ibid., 241.

Campholenic Acid—Derivatives of.—W. Thiel.—Ber. d. Chem. Ges., xxvi, 922.

Amide of Campholic Acid.—Action of Potassium Hypobromite.—G. Errera.—Abstract, Jour. Chem. Soc., 1892, 1345.

Camphoric Acid.—Function of.—A. Haller.—Compt. rend., cxiv, 1516.

——— Constitution of.—Ibid., cxv, 19; Ibid., cxvi, 121.

——— Methyl Salts of.—J. Waller.—Jour. Chem. Soc., 1892, 1088.

——— Hydrazones of.—E. M. Chaplin.—Ber. d. Chem. Ges., xxv, 2565.

——— *Ethereal Salts of.*—Brühl replies to Walker.—Ber. d. Chem. Ges., xxvi, 1097.

Acids Campholytic and Camphothetic.—J. Walker.—Pharm. Jour. Trans., 1893, 806; from Proc. Chem. Soc., 120, 43.

Camphene and Camphoric Acid.—W. O. Wallach.—Ber. d. Chem. Ges., xxv, 916; Jour. Chem. Soc., 1892, 868.—Brühl in Ber. d. Chem. Ges., xxv, 2087.

Hydrogenation of Closed Rings: Constitution of Camphoric Acid.—Stohmann and Kleber.—Abstract, Jour. Chem. Soc., 1892, 1040.

Camphoric Anhydride and Other Anhydrides.—Action of Alkali Alkyl oxides on, by Cazeneuve.—Compt. rend., cxvi, 148.

Action of Alkaline Alcoholates upon Camphoric Anhydride and Anhydrides; Formation of Camphoric Ortho-Ethers.—P. Cazeneuve, Bull. Soc. Chem. de Paris, ix and x, No. 3.

Alkylcyanocamphors and *Alkyl Benzeanezocamphocarboxylates.*—A. Haller.—Compt. rend., cxv, 97.

Camphoric Anhydride and Camphoric Ethers.—Action of Phenylhydrazine upon—Friedel and Combes demonstrate the existence of a ketonic function in the molecule of this acid and of its anhydride.—Chem. News, 1893, 168; from Bull. Soc. Chim. de Paris, ix and x, No. 2.

Methyl Camphocarbonylates, Methylcamphor and Azo-derivatives of Cyanocamphor.—J. Minguin.—Compt. rend., cxv., 126.

Propylamidophenol from Camphor.—P. Cazeneuve. From an investigation of this base it follows that the fundamental nucleus of camphor is really paracymene, as the other reactions of camphor indicate.—Compt. rend., cxv, 825.

Campholamine.—Errera.—Abstract, Jour. Chem. Soc., 1893, 108.

Camphorone.—Koenigs and Eppens.—Ber. d. Chem. Ges., xxvi, 810.

Ketopentamethylene and Ketohexamethylene—Derivatives of.—F. W. Semmler.—Ber d. Chem. Ges., xxv, 3513.

Sulphocamphylic Acid.—W. Koenigs and Hoerlin.—Ber. d. Chem. Ges., xxvi, 811.

Sulpho-conjugated Compounds of Camphor and their Derivatives, Propylnitrophenol and Propylamidophenol.—P. Cazeneuve.—Ibid.

Camphor—Constitution of.—P. Cazeneuve.—Ibid.

Leguminosæ.

Legumineuses de l'Ecuador et de la Nouvelle-Grenade de la Collection de M. Ed. André.—M. Micheli. An annotated list of the Leguminosæ collected by M. André in western equatorial South America in 1875 and 1876.—Jour. de Bot., 6, 117, 141, 187, and 197.

Astringent Barks of the Papilionaceæ.—H. Eduard divides them, pharmacognostically, into nine groups.—Pharm. Post., 1893, 2.

Leguminous Plant—Poisonous.—The leaves and seeds of Sophora secundiflora are said to produce tetanus in animals eating them, and a whole pod is said to be sufficient to kill a man. The seeds contain an exceedingly poisonous alkaloid, sophorine. The seeds are used by the Indians of San Antonio to produce intoxication, half a seed producing exhilaration, which is followed by sleep lasting 2 or 3 days.—Kew Bull., lxix, 216; Phar. Jour. and Trans., 1892, 264.

Secretory Apparatus of Copaifera.—L. Guignard has found a special

type of secretory apparatus existing under different forms alike in root, stem and leaf.—Phar. Jour. Trans., 1892, 443; from Compt. rend., 115, 673.

Abrus Precatorius.—An account of the preparation and use of the poison.—Indian Agric.; Pharm Era, 1893, 58.

——— *Inoculation by.*—Chem. and Drug., 1892, 903.

Asafœtida—History of the Word.—G. Planchon, in Jour. Pharm. Chem., 1893, 401.

Ceratonia Siliqua, L.—Ed. Heckel and F. Schlagdenhauffen have established the constituents of *St. John's bread;* following Dragendorff's method of plant analysis:

Petroleum ether extract, wax and fatty bodies		0.3
Alcohol extract	Glucose	13.0
	Saccharose	26.366
	Fixed salts	0.262
	Free butyric acid	0.500
	Wax, tannin and coloring matters	4.501
Aqueous extract	Glucose	4.165
	Saccharose	5.835
	Fixed salts	1.500
	Pectin, albuminous matter, gum	7.75
Incineration	Fixed salts	0.675
Difference	Cellulose	34.946
Loss		0.200
		100.000

—Rép. de Pharm., 1892, 529.

Copals—Analysis of.—Ed. Kresel points out that Zanzibar copal alone is entirely free from taste and aroma; all other kinds possess more or less aroma, and the Borneo and Manila copals have a bitter aromatic taste. He regards Brisson's estimation of the sp. gr. as defective. The melting point is stated to vary in proportion to the hardness of the resin, and is given as 175° to 370° C.—Chem. News, lxvi, 90, 103; Pharm. Jour. and Trans., 1892, 184.

Copaifera Langsdorffi, Desf.—A contribution to the Materia Medica by T. Peckolt.—Pharm. Rund., 1892, 234–238; Chem. Zeit. (Chem. Rep.), 1892, 314.

Copaiva Balsam—The Origin of.—A review of L. Guignard's work (Bull. Soc. Bot. de France, 1892, 233–260), by Flückiger.—Zeits. Oest. Apoth. Ver., 1892, 821.

Copaiba—Soluble.—H. S. Coupland. This can be made by treating copaiba with a strong solution of carbonate of potassium, and allowing the mixture to stand for some time, shaking occasionally. Part of the potassium combines with the copaivic acid of the resin, and part settles as bi-

carbonate to the bottom of the bottle, leaving the copaiba clear. Thus treated, it is miscible with water, forming an emulsion without the aid of any emulsifying agent.—Chem. and Drug., 1893, 734.

Copaiba—Solidification of.—H. W. Snow concludes, as the result of a series of experiments, that the percentage of resin in copaiba will generally be found to bear a close relationship to the solidifiable character of the oleo-resin when mixed with magnesia. His results show that samples containing less than 48 per cent. of resin will not be found satisfactory for making a mass.—Western Drug., 1892, 325.

Balsam of Peru—Examination of.—Gehe and Co. in their Bericht, Sept., 1892.—Pharm. Post, 1892, 1125.

Balsam of Copaiba—Examination of.—Ibid.

Cytisine and Ulexine.—See Alkaloids.

Radix Derridis Ellipticæ—Merck's Ber., 1892; Pharm. Post, 1893, 96.

Derris Elliptica—On the Malayan Fish Poison called Aker Tuba.—By Leonard May, Jr. The root contains the poison, which is a resinous substance for which the author proposes the name of "*tubain.*" It is brittle, reddish-brown colored, quite insoluble in water, paraffin oil, and benzene, but soluble in alcohol, ether and chloroform. Owing to the insolubility of tubain, it may be eaten by the fish with impunity. When a solution of it in alcohol is added to water, although the tubain is at once precipitated, still it is then active. One part of tubain in 350,000 parts of water proves quickly fatal to fish. By the aid of a small quantity of alcohol, it may easily be emulsified with soap, which on solution in water, presents the poison in an active form. The plant grows readily in the Straits Settlement. And there appears to be an important application of the poison to the destruction of the many insect pests to which garden and greenhouse plants are subject.—Phar. Jour. and Trans., 1892, 61, 62.

Erythrophlæum and Allied Barks—The Anatomy of.—K. Wedel.—Inaug.-Dissert., Erlangen.

Gambier.—In the Ceylon administration reports, H. Trimen records the precise manner of manufacturing gambier, as witnessed by him at Singapore. The short, leafy twigs, he says, are deftly stripped off the plants by hand and carried in baskets to the low sheds, under which are large circular vats containing boiling water. The leaves and twigs are kept in this boiling water for six hours, during which time they are stirred and bruised by men armed with long-handled forks of wood. The liquid, which by this time resembles thin pea soup, is next drained into shallow wooden tubs to cool. The men then thrust a short, thick, smooth cylinder of soft mahang wood into the liquid, and agitate the same by rubbing their fingers up and down the cylinder. The fluid shows signs of thickening, and at the end of about fifteen minutes the whole contents of

the tub become solid, and after a while may be turned out as from a mould and cut into tubes. This solidification is supposed to be the result of the crystallization of catechuic acid.—Am. Drug., 1893.

Gleditschia triacanthos.—Analysis of the Fruit by Heckel and Schlagdenhauffen (Rép. de Pharm., 1893, 1) with the following results:

Petroleum ether extracted wax		0.625
Alcohol extracted glucose and saccharose		37.650
Water extracted	gum, pectin and tannin	23.993
	salts	8.409
Incineration of residue gave salts		0.596
Difference,	albuminous matter	8.300
	lignin and cellulose	20.427
		100.000

They have confirmed the observations of former investigators of the absence of alkaloid in the alcoholic extract.

Goa Powder.—E. J. Millard examined 8 commercial samples and obtained from 4.0 to 28.6 per cent. of ash, which consisted chiefly of SO_2, Al_2O_3 and Fe_2O_3.—Chem. and Drug., 1892, 745.

Gymnocladus Canadensis (chicot or stump tree, coffee bean, Kentucky magnolia).—By J. H. Martin. Various parts of the tree were submitted to proximate analysis. The pulp contained wax, resin, a glucoside, glucose, tartaric and citric acids.

The inner part of the bean was found to have a slight acrid taste, and to contain 10 per cent. of greenish-yellow fixed oil, having a specific gravity of 0.913, and easily saponified by the fixed alkalies. It was slightly soluble in absolute alcohol, and readily soluble in petroleum ether and ether. The presence of saponin was strongly indicated in the alcoholic extract.

The testa was found to contain 5 per cent. of fat and 1.7 per cent. of green wax, the latter having an acrid and nauseating taste. Gallic and tannic acids were shown to be absent.

The pod yielded to petroleum ether 3.8 per cent. of a greenish-yellow fat, to stronger ether 1.7 per cent. of a greenish substance soluble in acidulated water, and to absolute alcohol a brownish substance soluble in water.

The bark of the tree was exhausted with petroleum ether, which dissolved about 10 per cent. of a greenish fixed oil, having a specific gravity of 0.933, and easily saponified by the fixed alkalies, but sparingly by ammonia. It was found to be almost insoluble in absolute alcohol, but soluble in ether, chloroform, benzol and glacial acetic acid. No indications of alkaloid were obtained in any of the parts examined. Saponin appears to be the principle to which the physiological activity of the plant is due, and is present in all parts.—Am. Jour. Pharm., 1892, 557–559.

Faba Impigem.—Merck's Ber., 1892 ; Pharm. Post, 1893, 96.

Indigo Crop—Bengal.—Statistics.—Pharm. Era, 1893, 226.

Indigo—Valuation of.—O. Müller.—Chem. Zeit., 16 (Rep.), 206 ; Zeitschr. f. anal. Chem., 1893, 116.

Indigo when Heated with Alkalies.—Behavior of. Heumann and Bachofen find it to give the reactions of indoxyl.—Ber. d. Chem. Ges., xxvi, 225.

Indigotin in Commercial Indigo—Estimation of.—O. Miller.—Abstract, Jour. Chem. Soc., 1893, 352.

Turbid Kinos.—J. H. Maiden describes a large group of what he terms "Turbid Kinos" from the fact that they all form turbid solutions in water, owing to the presence of catechin. These kinos are always in small fragments, and a typical one is described as being of a reddish-brown color, odorous when perfectly fresh, and bright whilst unhandled. In a few weeks the fragments become dull by their own disintegration and powder readily between the fingers, forming a fine powder of a buff color. The research is said to enable an investigator to pronounce whether a kino is the product of a eucalypt belonging to the Renantheræ or not, and to confirm the affinity existing between stringy barks, iron barks, etc. Some species may be named from the kino alone, and it is possible to state whether a kino contains catechin from physical characteristics only. Further advantages secured are the ability to pronounce what species are suitable for tincture-making, and what satisfy the requirements of pharmacopœias with regard to kino.—Proc. Linn. Soc., N. S. W., 389 ; Pharm. Jour. and Trans., 1892, 81.

Australian Kino—New.—J. H. Maiden describes a new kino, obtained from the "Native Wistaria," *Milletia megasperma*, F. v. M. It occurs as a ruby-colored, transparent substance, breaking readily with a clear, conchoidal fracture, and is powerfully astringent. The kino is soluble in cold alcohol and in water, forming a rose-tinted solution with the latter. It consists essentially of tannin and water, its composition being stated as tannic acid, 78.2 ; ash, .8 ; moisture, 20.1 ; insoluble impurities, .9 per cent. This is the first record of a kino occurring in the *Leguminosæ* in Australia.—Phar. Jour. Trans., 1892, 443 ; from Proc. Linn. Soc., N. S. W., 6, 679.

Russian Liquorice.—Pharm. Jour. Trans., 1893, 974 ; Consular Report, 1191, 5.

Turkish Liquorice.—Pharm. Jour. Trans., 1893, 789 ; Consular Report, 1892, 1121–42.

Loco—Some Observations upon.—Dr. Mayo. The author concludes that the "Loco" disease is the result of malnutrition caused by the affected animals eating freely of Astragalus mollissimus and Oxytropis Lambertii.—Bull. Kansas Agric. Exper. Sta., No. 35.

Loco Poisoning—Further Notes on.— L. E. Sayre records the case of a horse which had never seen loco, but possessed all the symptons attributed to loco poisoning.—Amer. Drug., 1893, 323.

Lupinus—Alkaloids of.—See Alkaloids, etc.

Loco Weeds.—Alice Eastwood.—Zoë, iii, 53.

Mimosa Bark.—The improvement of the bark after a year's storage is attributed to the augmentation of catechu-tannic acid through conversion or oxidation of catechuic acid. Exposure to weather, particularly moisture, causes loss of tannic acid by formation of pyro-catechin.—Pharm. Jour. Trans., 1893, 886.

Owala Seed.—E. Heckel describes the seeds of Owala (Pentaclethra macrophylla, Benth.). They contain according to analysis a greater proportion of nitrogenous compounds than any of the ordinary leguminous plants except the Soy (Soya hispide) and beans.—Rép. de Pharm., 1892, 337.

Pambotana as an Astringent.—Pambotana is obtained from a Mimosa, Calliandra Houstoni, Benth. It owes its medicinal value to a tannin of very astringent quality. A peculiar characteristic of this tannin is that it easily turns red in contact with the air.—Merck's Bull., May, 1892, 253; Pharm. Jour. and Trans., 1892, 3.

Pea-Nut Meal or Grits.—Analyses of this new food substance by H. Noerdlinger. This paper demonstrates that in the prepared pea-nut we have the cheapest and at the same time the most powerful nutriment, weight for weight, yet discovered.—Nat. Drug., 1893, 65; from Drug. Zeit.

Pea-Nut Meal.—A new food product which is cheap and rich in albumen.—P. Fürbringer, Berl. klin. Wochenschr., 1893, 204.

Pueraria Tuberosa.—Schimmel and Co.—Pharm. Post, 1893, 208.

Senna—The Cathartic Acid of.—A. Gensz obtained this acid in an amorphous condition, and Kobert has made some pharmacological experiments.—Pharm. Post, 1893, 281.

Cathartic Acid and its Action.—R. Kobert.—Bull. Pharm., 1893, 246.

Cathartic acid, the active principle of senna, prepared by the directions of previous investigators, Kubly and Stockmann, was found to be of questionable activity. An improved method yielding a satisfactory product was found in the following: 2 kilos senna leaves were covered with boiling water; after 24 hours the liquid was expressed and evaporated in vacuo, the residue treated with 95 per cent. alcohol for twenty-four hours, and the liquid decanted; this operation was repeated and the combined and filtered alcoholic solutions precipitated by neutral acetate of lead; the precipitate was thoroughly washed, made into a paste with alcohol and decomposed with hydrogen sulphide; the excess of the latter was removed by a current of air, the mixture heated on a steam bath for one-half hour

(using an inverted condenser) and the alcoholic solution separated; the residual lead sulphide was again extracted and the combined filtrates mixed with ether, which caused the separation of a pale yellow precipitate: this was dissolved in 30 per cent. alcohol and evaporated at a temperature not exceeding 50° C. The yield was 12-15 Gm.; the product is amorphous, difficultly soluble in cold water, readily soluble in boiling water; the best solvent is a 30-40 per cent. alcohol: ether, benzin, chloroform, petroleum-ether, are without solvent action. The formula from the results of combustions appears to be $C_{30}H_{26}NO_{15}$. Pharmacological experiments by Dr. Kobert and others upon the lower animals demonstrate that they require large doses for satisfactory action not accompanied by any symptoms of poisoning; numerous experiments upon man prove that 0.1-0.15 Gm. is a sufficient dose as a painless cathartic acting in from 3 to 8 hours.—A. Gensz (Dorpat Dissert.). Pharm. Post, 1893, 281; Am. Jour. Pharm., 1893, 334.

Sparteine.—See Alkaloids, etc.

Tamarind Trees of Jamaica.—Allan Eric.—Drug. Circ., 1892, 195.

Tragacanth Yielding Plants.—Description of, in Month. Mag. of Pharm.; Drug. Circ., 1892, 259.

Astringent Gum from Mashouland.—E. M. Holmes. The plant yielding this gum is Brachystegia spicæformis, Benth.—Pharm. Jour. Trans., 1893, 585.

——— Chemical examination by A. W. Southall. It possesses greater astringency than kino, and on account of this and its highly colored solutions it appears to be suitable for use in some preparations employed in pharmacy, such as astringent lozenges and liquid dentrifices, etc.—(Ibid, 600.)

Gum Arabic—Artificial.—For the preparation of a so-called artificial gum arabic the Rev. de Chim. Indust. (through Nouv. Remèdes, 1892, No. 13 supplem.) gives the following process: 10 kilograms linseed are boiled with 80 kilograms sulphuric acid and 100 liters of water for three or four hours. The liquid is then filtered and four times its volume of alcohol is added. The precipitate is collected, washed and dried. The product is amorphous, colorless, insipid, and gives with water a thick mucilage.—Am. Jour. Pharm., 1892, 516.

Gum Trade—Revival of the Soudan.—Editorial, Chem. and Drug., 1892, 484.

Acacia or True Gum Arabic is now again obtainable by reason of the somewhat more settled condition of Egyptian affairs, and the re-opening of the Soudan, the chief source of our supply.—Squibb's Ephem., Feb., 1893.

Oxidation of Gum Arabic.—Production of Mucic Acid (Hexabepic Acid) by E. Maumene.—Bull. Soc. Chim. de Paris, ix and x, No. 5.

Gum Arabic—Facts to Contribute to the History of.—A. Béchamp, with Dubrunfaut, holds that the molecule of gum consists of dextrorotatory and lævorotatory members.—Bull. Soc. Chim. de Paris, Chem. News, 1892, 257.

——— Béchamp concludes that gum arabic contains a zymose which transforms amylaceous matter.—Ibid., 1893, 168.

Dextrin and Gum Arabic—Molecular Masses as Determined by their Osmotic Pressures.—C. E. Linebarger's results indicate that the simpler molecular formulæ, which are usually taken to represent these substances, should be multiplied by seven to get the true molecular formulæ.—Amer. Jour. Sci., 43, 426.

Barrister Gum.—A gum exuded by "The Barrister," *Mezoneurum scortechinii*, F. v. M., is described by J. H. Maiden as being horny and gelatinous-looking, resembling that of *Acacia decurrens* in external appearance. It is only slightly soluble in cold water, in which it swells up to several times its original bulk. Boiling water does not readily dissolve it, nor do potash and soda solutions. A canary-yellow color appears when the gum is in these alkaline liquids, but this fades on cooling. Dilute hydrochloric acid dissolves it, and addition of an alkali in excess then causes a precipitate. Barium hydrate also causes precipitation from the acid solution, as in the case of tragacanth. The properties of barrister gum are evidently very similar to those of tragacanth, and its composition is given as follows: Soluble in cold water, 16.5; soluble in acids, and insoluble in alkalies, 68.57; moisture, 10.95; ash, 3.98 per cent. It appears to contain neither arabin nor metarabin.—Pharm. Jour. Trans., 1892, 441; from Proc. Linn. Soc., N. S. W., 6, 680.

Kauri Gum—The Production in New Zealand.—Pharm. Jour. Trans., 1893, 630; from New Zealand Hand-book for 1892.

Gum Senegal.—Formation of and trade in the gum.—S. Cotton in Jour. Pharm. Chim., 1893, 598.

Lichenes.

Orchilla in Lower California.—U. S. Consul Viosca.—Pharm. Record, 1892, 69.

Liliaceæ.

Liliaceæ of Brazil.—T. Peckolt contributes to our knowledge of Aloes barbadensis, Ruscus aculeatus, Smilax syphilitica, S. papyracea, S. japecanga.—Pharm. Rund., 1893, 80.

Agave americana—Researches on the Sugar of.—By G. Michaud and J. F. Tristan.—Am. Chem. Jour., 1892, 548.

Allium—Oil of.—See Olea.

Aloes.—Notes on a sample of South African Aloes, with characteristics strongly resembling Socotrine.—Chem. and Drug., 1893, 111.

Aloes.—E. M. Holmes. The author has endeavored to account for the differences in character and odor that distinguish Curaçoa aloes from the ordinary Barbadoes variety. Both are affirmed to be the product of Aloe vulgaris, Lam. Mr. Holmes attempted to solve this problem three years ago, when he proved that the former kind is really obtained from Aloe chinensis, Baker, and the conclusion he arrived at was that the Aloes of Curaçoa were probably modified to some extent by an admixture of the juice from the leaves of Aloe spicata and A. socotrina. This has been disputed by S. C. Henriquez, a manufacturer of aloes at Curaçoa, who sent specimens of his preparations to the Pharmaceutical Society's museum in March of this year, together with some interesting information concerning the process of manufacture. These notes are quoted in detail in Mr. Holmes' paper, together with descriptions of the various methods adopted. It would appear that the length of time that has elapsed since the collection of the juice is an important factor in determining the characteristics of the finished product. Experiments conducted by Mr. Holmes and H. D. Fuge point to the fact that the sooner the juice is dealt with after collection the larger is the proportion of soluble matter that can be extracted from the dried aloes by boiling water. Curaçoa aloes may differ considerably in appearance, being either dull, like Barbadoes, or vitreous, like Cape aloes. It yet remains to be shown whether the Barbadoes variety has the same origin as the Curaçoa aloes, and to what the difference in odor is due.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 232–234. (Also Drug. Circ., 1892, 273.)

——— *A Reagent for.*—L. Schoutelen. A concentrated solution of borax produces in liquids containing aloes (1 : 10,000), on standing from 20 to 25 minutes, a green fluorescence, which disappears on long standing. —Zeitschr. f. Anal. Chem., 1892, 723; Zeits. Oest. Apoth. Ver., xlvi, 249.

Aloin.—A description of a new process for extracting aloin, by Lewis Ough.—Chem. and Drug., 1892, 837.

Asparagus—The Pharmacology of.—Drug. Circ., 1892, 159; from N. Y. Med. Jour.

Convallaria majalis offers a very efficient alternative for digitalis in many cases.—Squibb's Ephem., Feb., 1893.

Parisette (*Paris quadrifolia, L.*) *in Medicine.*—C. Richet compares its properties with those of aconite, for which it may sometimes serve as a substitute.—Merck's Bull., 1892, 312; Phar. Jour. and Trans., 1892, 83.

Sarsaparilla—A contribution to the knowledge of.—W. von Schulz.—Dorpat, C. Mattiesen, 94 p.

Sarsaparilla—Constituents of.—W. v. Schulz has undertaken an extensive investigation of sarsaparilla, and has isolated its glucosidal constituents. The parillin of Flückiger and the saponin (smilacin) of Dragendorff are shown to be homologous compounds, belonging to a series with the

general formula $C_nH_{2n-8}O_{10}$, of which a third member, sarsasaponin, has now also been discovered. The three constituents, smilacin or sarsaparill-saponin, $C_{20}H_{32}O_{10}$, sarsasaponin, $C_{22}H_{36}O_{10}$, and parillin, $C_{26}H_{44}O_{10}$, on boiling with dilute acids are split up into sarsasapogenin, or parigenin, and one or more molecules of sugar. Physiological experiments made with the glucosides show that in pharmacological value they belong to the same group as sapotoxin.—Brit. Méd. Jour., 1640, Epit., 92; Pharm. Jour. and Trans., 1892, 6.

——— According to Kobert's researches there are three glucosides present. *Parillin* ($C_{26}H_{14}O_{10}+2\frac{1}{2}H_2O$), insoluble in water; *saponin* (sarsaparill-saponin) $5(C_{20}H_{32}O_{10}+2\frac{1}{2}H_2O)$, soluble in water; *sarsasaponin* $12(C_{22}H_{36}O_{10}+2H_2O)$, easily soluble in water and the *most poisonous* of the constituents. These substances injected into the blood, the red corpuscles are destroyed more rapidly than by most of the known poisons; they have action similar to the quillaja glucosides, but are weaker. These constituents are not absorbed into the system when administered, except by injured membranes, hence the questionable value of sarsaparilla. Kobert denounces the simultaneous administration of mercurials and sarsaparilla, since the lesions of the intestinal membranes frequently caused by the former may allow of the absorption of the poisonous sarsaparilla glucosides.—Rundschau, 1892, 611; Am. Jour. Pharm., 1892, 465.

Saponin of Sarsaparilla.—Bericht of E. Merck, 1893, 96.

Veratrine.—See Alkaloids, etc.

Xanthorrhœæ Resin.—Valuable research, by A. Schober, concerning the origin.—Zeits. Oest. Apoth. Ver., 1892, 500.

Lineæ.

Coca Leaves.—O. Hesse (Annal. der Chem., 271, 180–228).—In this paper the author gives a short account of the various substances which have been obtained from coca leaves; with a few exceptions, most of the compounds here referred to have been previously described by the author, Liebermann, Einhorn, Giesel and others.

1. *Cocaine,* contained apparently in all the varieties of coca leaves, and almost free from other alkaloids in the Peruvian and Bolivian coca leaves. The *anhydroecgonine,* obtainable from the same, forms a salt, the chemical formula of which is $C_9H_{13}NO_2.HCl+H_2O$. This salt when anhydrous melts at 238–240° C.

2. *Isococaine.* Dextro-cocaine is (contrary to Liebermann) not contained in coca leaves.

3. *Cinnamylcocaine* is contained in considerable quantity in Trujillo—namely, Java and Indian leaves. Its hydrochloride contains two molecules of water, and in the anhdyrous condition has a melting point of 176° and $[\alpha]$ D = — 104.1° C.

4. *Cocamine*, contained in all varieties of coca leaves, is decomposed by dilute hydrochloric acid into ecgonylcocainic acid, $C_{27}H_{29}NO_6$, which on further heating decomposes into cocainic acid (according to Liebermann, polymerous cinnamic acid) and ecgonin. Cocamine has the molecular composition $C_{19}H_{23}NO_4 + \frac{1}{2}H_2O$ and not $C_{38}H_{46}N_2O_8.H_2O$, as has been previously stated.

5. *Isococamine*, contained in all varieties of coca leaves, when air-dried has apparently the same composition as the air-dried *cocamine*, and differs from the latter but slightly in respect of form, melting point and other characteristics.

6. *Homococamine*, contained in South American but not in Venezuelan coca leaves, resembles cocamine in chemical composition. The homococainic acid, $C_9H_8O_2$, obtained from homococamine by decomposition, melts at 150° C. and forms the amorphous salts: $(C_9H_7O_2)_2Pb$, $(C_9H_7O_2)_2Cu - 3H_2O$, $(C_9H_7O_2)_2Ag$; an ether, $C_9H_7O_2.CH_3$, and a nitro acid, $C_9H_7(NO_2)O_2$, having a melting point of 226° C.

7. *Homoisococamine*, a constituent of the South American leaf, could not be obtained pure; by decomposition, it yields homoisococainic acid, $C_9H_8O_2$, occurring in crystalline needles having a melting point of 162° C., and forming a salt of copper represented by the following formula: $(C_9H_7O_2)_2Cu + 2H_2O$.

8. *Benzoylpseudotropeine*, $C_{15}H_{19}NO_2$, from Java coca leaves, yields an iodo-methyl compound, and is decomposed by hydrochloric acid into benzoic acid and pseudotropeine, $C_8H_{15}NO$, the platinum salt of which $(4H_2O)$ in the anhydrous condition melts at 206° C., its gold salt at 202° C., and the iodomethylate at 270° C.

9. *Hygrine* has its origin in the solvents, and is apparently not a natural constituent of the leaves.

INDIFFERENT SUBSTANCES CONTAINED IN COCA LEAVES.

O. Hesse found the following indifferent substances in coca leaves:

1. In the wax from Trujillo leaves were detected small quantities of β-cerotinone and palmityl-β amyrine; while large quantities of these substances are found in the wax from Peruvian and Bolivian coca leaves.

3. In the wax from Java coca leaves were found palmityl-β-amyrin, β-cerotinone, cerin, an ether of myristic acid, and possibly also of oxycerotic acid. The latter, $C_{27}H_{54}O_2$, is transformed into cerotic acid by the action of anhydrous acetic acid at 100° C. Further, there have been found in the broad Peruvian and Bolivian leaves coca-tannic acid, eocetin (= Warden's coca-tannic acid) in Indian coca, carottin in a Bolivian variety, and a number of amorphous bases of unknown composition in a variety of coca leaves.

Cocaine and other Alkaloids of Erythroxylon.—See Alkaloids.

Coca Leaves—Remarks upon Hesse's Dissertation to the Knowledge of. —By C. Lieberman, (Ann. d. Chem., 272, 338). The author calls Hesse to account and states that his truxillic acid (truxillsäure) is written by Hesse cocaic acid (cocasäure).—Ber. d. Chem. Ges., Ref. 46, 1893. (Original, see Ann. der Chem., 272, 238.)

Flaxseed—Proteids of.—Thos. B. Osborne.—Am. Chem. Jour., 1892, 629.

Linseed Cake and Meal—Manufacture and Composition of.—Two papers by Haselhoff and F. J. Van Pesch. Not only do the authors consider the manufacture and composition, but also the adulterations which are employed. Upon this latter subject they say: Not only vegetable substances but also heavy spar, gypsum, chalk and salt are employed; saw-dust has been found. Rape-cake meal may be detected by stirring in water in a glass cylinder and allowing to settle; if any dark particles are visible, rape is probably present. A few drops of aqueous alkali will give an intense yellow color if rape is present. Amygdalin does not seem to be actually injurious, but mustard, corn-cockle, and *Camelina* are said to be injurious, whilst castor oil is poisonous and may cause death. Vegetable impurities can mostly only be detected microscopically, and the amounts only approximately estimated. But the amount of fat, and especially of protein, gives a good idea as to purity or otherwise. When mineral impurities are present they may be detected by the amount of ash, which generally should not exceed 5 per cent. Cake containing over 14 per cent. of water cannot be considered as pure.—Landw. Versuchs.-Stat., 41, 55–93; Jour. Chem. Soc., 1893, Abstr. 38.

Flax Culture for Fibre in the United States—Report on—C. R. Dodge, Washington, 1892.

Loganiaceæ.

Woorara: The Arrow Poison of the South American Indians.—T. J. Keenan.—Pharm. Record, 1893, 173.

Insane Root.—Discussion in Chem. and Drug., July, 1892, 28, 62, 249. Probably Shakespeare's "Insane Root" is Nuces insanæ.—David Hooper does not come to this conclusion. He says it must have been of European origin.—Chem. and Drug., 1892, 530.—Continuation, 563.

Gelsemium sempervirens.—The active constituents of.—A. R. Cushny. —Arch, f. exper. Path. u. Pharmakol., 1892–93, 49–68.

Gelsemine.—See Alkaloids.

Strychnine.—See Alkaloids.

Lycopodiaceæ.

Lycopodium Laururus.—Alkaloid pillyanine.—See Alkaloids.

Lythraceæ.

Cuphea viscossima.—Examination by C. Correns of the epidermis of the

seeds.—Ber. d. Chem. Ges., 1892, 143; Zeits. Oest. Apoth. Ver., 1892, 500.

Magnoliaceæ.

Drimys chilensis.—Otto Witte has obtained from the bark of this plant a volatile oil, belonging to the group of terpenes, also a crystalline substance, apparently a camphor.—Boletin de Méd. de Santiago; Rev. internat. de Bibliog. Méd., 1892, p. 984; Am. Jour. Pharm., 1893, 15.

Malvaceæ.

Removal of Hairs from Cotton-seed.—W. S. Dudley and N. W. Perry have devised a chemical process to strip the seed of its fibre.—Jour. of Analyt. and Applied Chem.; Pharm. Jour. and Trans., 1892, 268.

Cotton-Seed Cake.—Maxwell obtains from 5 pounds of cotton-seed cake 1.08 Gm. Cholinhydrochloride and 6.168 Gm. Betaïn hydrochloride.—Chem. Centr. Bl., 1892, 170; Phar. Centralh., 1892, 416.

Marantaceæ.

The Arrowroot Plantations of Coomera and Pimpama, Queensland.—H. L. Thompson. An account of the cultivation and manufactures of the arrowroot from Canna edulis.—Pharm. Jour. (Aus.), 1892, 87; Am. Jour. Pharm., 1892, 631.

Zanzibar Arrowroot.—Pharm. Jour. Trans., 1893, 789; Consular Rep., 1892, 266.

South Sea Arrowroot is the product of *Tacca pinnatifida*, Forst. This is a perennial herbaceous plant, with a tuberous root. As a source of arrowroot the plant is of great value. The tubers when fresh resemble new potatoes, and contain a great deal of starch. Tacca arrowroot is preferable to any other in cases of dysentery and diarrhœa.—Chem. and Drug., from Meyer Bros.' Drug., 1892, 303.

Melanorrhœæ.

The Renga (Melanorrhoea Curtisii, Oliv.).—Note on the therapy.—Chem. and Drug., 1893, 111.

Meliaceæ.

Cocillana.—Therapeutical Applications of.—J. V. Shoemaker.—Med. Bull., 1893, 43.

Melia dubia.—Schimmel and Co.—Pharm. Post, 1893, 208.

Semen Swietenia humilis.—Merck's Ber., 1892; Pharm. Post, 1893, 96

Menispermaceæ.

Pareira brava.—Pharm. Era, 1892, 228.

Monimiaceæ.

Atherosperma moschata—Volatile Oil—Action of.—Ralph Stockman from careful experiments concludes that neither the volatile oil nor any other constituent of the bark of *Atherosperma moschata* is particularly active or poisonous, and further that the volatile oil has a close resemblance in physiological action to other volatile oils. Regarding its uses as a diaphoretic, expectorant and alterative, there is little doubt that it is simply similar to the many other essential oils or plants containing them which are used in medicine for similar purposes.—Phar. Jour. and Trans., 1892, 512.

Laurelia aromatica.—Otto Witte isolated from the bark of this Chilean tree an alkaloid which he named *laureline.* Its reactions are similar to those described by Zeyer for atherospermine (see Amer. Jour. Phar., 1862, p. 166), and it resembles also the boldine of Bourgoin and Verne (ibid., 1872, p. 560). The plants from which these alkaloids have been obtained belong to the order Monimiaceæ, and it seems probable that the three alkaloids are closely related.—Am. Jour. Pharm, 1893, 16.

Moringeæ.

Moringa pterygosperma.—A contribution to the materia medica, by T. Waage, in Pharm. Centralh., 1892, 520–523.

Myoporineæ.

Myoporum Manna.—J. H. Maiden has ascertained that the manna obtained from Myoporum platycarpum consists almost entirely of mannite, and is practically identical with the product of Fraxinus Ornus.—Phar. Jour. Trans., 1893, 608.

——— F. A. Flückiger.—Pharm. Zeit., 1893, 39.

Myosinaceæ.

Embellate of Ammonia.—G. Coronedi has studied this preparation, which is derived from the seeds of Embellia Ribes. The dose is 3 to 6 grains; against lumbricoids and tæniæ.—Lo Sperimentale, 1892, 141; Am. Jour. Med. Sci., 1892, 339.

Myristicaceæ.

Nutmegs—Useful Varieties of.—Dr. Warburg, in a paper (read at the meeting of the Berlin Pharmaceutical Society, June 2; reprinted from Pharm. Jour. and Trans., July 2, 1892), reviews the history of Nutmegs, and throws considerable light upon *Myristica argentea*, Warb., which has remained unknown and undescribed, as well as the plant by which it is produced. Warburg succeeded in obtaining information on this point through the assistance of a native, who was persuaded to show him some of the trees in Dutch New Guinea. They were characterized by large leaves having a silvery appearance at the under side, and hence the name.

Next to *Myristica fragrans* the *M. argentea* is certainly the most important variety, and that which has the greatest future. The odor is not so delicate as that of the true nutmeg, but that may be due to the circumstance that it is not prepared and packed with as much care as the true kind. Now they are all taken direct to Macassar, where they are shelled and dusted with lime. The price of them in Macassar is about one-third that of the best quality of true nutmegs. They are now regularly imported by way of Amsterdam into England as long nutmegs, and they have been known in Germany since 1890 as horse nutmegs.

These nutmegs would come into actual competition with true nutmeg only in the event of their being carefully cultivated and gathered, as the produce of *M. fragrans* is in Hainen, and it is not improbable that their lower price would be compensated by a larger yield.

The nutmegs of *M. argentea* differ from true nutmegs in their narrow, long shape, and the relatively less marked arillus furrows. The arillus generally consists of four broad stripes, which are united above and below. The same with the hard shell is from 3½ to 4½ cm. long, and from 2 to 2½ broad. It is broadest at the base, and becomes gradually narrower towards the end, externally of a bright red-brown color when fresh, but as met with in commerce it is generally rubbed, and of a yellow-brown color. The fruit is imbedded in a very thick pericarp, and when fresh it is from 4½ to 6½ cm. long, and 4½ to 5½ cm. broad. The testa is nearly 1 mm. thick. The endosperm contains much starch, and the brown runcination streaks, which alone contain the aroma, are more scattered and coarser than in true nutmegs. The cotyledons are joined in a disc swelled at its edges to 5 mm. diameter.

Among other available kinds of nutmegs the author mentioned *M. succedanea*, Reinw., discovered by Reinwardt in the island of Tidore, one of the Moluccas, in 1821. The nutmegs can scarcely be distinguished from those of *M. fragrans*, and they are very aromatic. The leaves and flowers of this variety are, however, quite different from those of *M. fragrans*.

In New Guinea there is a great number of varieties of nutmeg plants, the produce of which possess some aroma, but though permanent it is generally too feeble to admit of these kinds being used to any extent as substitutes for true nutmegs.

As an adulteration of true mace the arillus of *M. malabarica*, Lam., known under the name of Bombay mace, has been used during the last two centuries. It is much larger and more cylindrical than the arillus of true nutmeg, and the several flaps are united at the apex, forming a conical structure. The anatomical structure is also different, as may be seen by the aid of a microscope. When moistened with hydrochloric acid the Bombay mace presents the marked peculiarity of assuming a greenish color.—Am. Jour. Pharm., 1892, 435–438.

Bombay Mace.—Waage and Warburg recommend the micro-chemical test with potassium chromate.—Zeits. f. Anal. Chem., 1892, 582.

Papua-Macis.—T. Waage describes the arillus of Myristica argentea.—Pharm. Centralh., 1893, 131. (See, also, Ibid., 150).

Myrtaceæ.

Angophora Kino.—T. H. Maiden. The importance of the genus Eucalyptus and the almost universal occurrence of kino in these trees has thrown the subject of kino in the closely related genus Angophora almost entirely into the shade. Although some species are very common and yield it abundantly, a prejudice might arise against Angophora kinos being officially recognized as substitutes for that of Pterocarpus, partly because an odor is inadmissible in this substance. If a use should be found for them, the author believes that the kinos of any of the species may be mixed without detriment, as they appear to have practically the same composition when gathered under similar circumstances.

Angophoras are confined to the east coast of Australia; they are five in number, four of them being found in New South Wales, while one, A. Woodsiana, is peculiar to Queensland. A. cordifolia is peculiar to New South Wales; A. intermedia has the widest range, extending from Victoria to Queensland. A. lanceloata and A. subvelutina are found in Queensland as well as in New South Wales. They are well known as "apple trees" (although some species have other names in addition).

The author describes these trees and four specimens of kino obtained from A. intermedia, D. C., and two kinos from A. lanceolata, Cav.—Pharm. Jour. (Aus.), July, 1892; Am. Jour. Pharm., 1892, 29.

Clove Cultivation.—An account of the germination; planting out; after treatment; age of trees; enemies; collection; drying and exports. The exports of cloves from Zanzibar for 1890–91 are as follows:

	1890. Frasilas.	1891. Frasilas.
Zanzibar	124,929	62,017
Pemba	385,981	326,986

1 frasila = 35 lbs.—Am. Jour. Pharm., 1893, 308; from Phar. Jour. Trans., 1893, 808.

Eucalyptus—Notes on.—W. C. Tyndale.—The respective hygienic value of various trees may to some extent be judged by the percentage of oil in their leaves as stated below:

	Per cent. of oil.
E. Amygdalina	3.313
E. Oleosa	1.250
E. Leucoxylon	1.060
E. Goniocalyx	.914
E. Globulus	.719

The lesser quantity of oil in E. globulus is compensated for by vigor of its growth, and early copiousness of its foliage. It readily adapts itself to other climates, and hence abroad nearly all varieties of the oil are known as globulus. During the last twenty years the blue gum has come into high repute as a sanitary tree. A high authority states that the sewage system of large towns in warm climes would be simplified if each house had the evergreen gum-tree in the back yard. The disinfecting and deodorizing virtues of the tree are unquestionable.

Flesh of any kind is as well preserved by eucalyptus oil as by creosote, while beef sprinkled with it will dry hard without putrefaction. It is fatal to bacteria and other micro-organisms. It may be injected into the veins and arteries of cadavers for purposes of preservation. It is also a good admixture in dressing gangrene.—Jour. Amer. Med. Assoc., 1893, 70; Am. Jour. Pharm., 1893, 89.

Eucalyptus globulus.—W. H. Bentley.—Med. Summary, Phila., xiv., 115.

Eucalyptus globulus and its Uses.—H. Benjafield. Pamphlet on the sanitary and medicinal properties of the true eucalyptus oil, obtained from the "Blue Gum Tree" of Tasmania.—Chem. News, 1893, 120.

Eucalyptus globulus—Anatomy of the Leaves of.—G. Biosi.—Arch. ital. de biol., Turin, 1892, 202.

Eucalyptus Oils.—See Olea.

Eucalyptol.—R. H. Davies and T. H. Pearmain have obtained what they regard as a practically pure product of eucalyptol, and are inclined to consider that it should be free from any characteristic odor, and possess no rotatory power.—(Brit. Pharm. Conference.) Pharm. Jour. and Trans., 1892, 205.

Eucalypteol.—Chemical and physiological properties, by Antoine.—Rép. de Pharm., 1893, 16.

Eucalypteol.—Eucalypteol or hydrochlorate of eucalyptene occurs in the form of white micaceous scales, having an odor resembling that of camphor, and a peculiar, slight but persistent taste. The compound is almost insoluble in water and glycerin, but freely soluble in alcohol, ether, chloroform, fixed and volatile oils, petroleum ether, and acetic ether. Alcohol, however, causes a slight decomposition in the cold, a substance being formed of which the odor recalls that of terpinol. A similar reaction may be caused by water, especially in the presence of alkalies, hydrochloric acid or an alkaline chloride, and a terpinol-like hydrocarbon of agreeable odor resulting. Eucalyptol melts at 50°, and commences to decompose near 115°. Therapeutically, it is said to cause no ill effects, being well tolerated by the stomach and producing no irritation. No toxic effects were presented even when as much as ten to fifteen Gm. of the compound was adminstered in a single dose. The usual adult dose is

1 to 1.5 gram daily.—Phar. Jour. Trans., 1893, 685; from Bull. Gén. de Thérap., 122, 316 and 433.

Eucalypto-resorcin.—A crystalline product, soluble in alcohol. Used in phthisis by inhalation of an alcoholic solution.—Merck's Ber., Jan., 1893.

Eugenia (Syzygium) Jambolana.—The seeds and bark are being used successfully in diabetes.—The Am. Therap., 1893, 244.

Jambul—Its Influence on the Action of Diastatic ferments.—Thomas Stephenson suggests that a medicinal preparation of jambul should be made of the fresh seeds, discarding the pericarps and avoiding the application of heat. A weak alcoholic menstruum extracts the active constituents and gives a stable preparation, and he suggests that the process of repercolation might be employed with advantage. The method of testing adopted was to mix a definite quantity of starch mucilage with two grammes of malt extract, adding the different preparations of jambul, and then keeping the liquids at a temp. of 96° to 100° F. for two hours. The sugar was then determined by means of Fehling's solution.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 211–213.

Spermolepis gummifera.—The products of Chêne-Gomme, by Heckel and Schlagdenhauffen.—Rép. de Pharm., 1893, 241.

Oleaceæ.

Monographie of Species of Fraxinus.—Alfred Wesmæl.—Monograph of 23 species of ashes.—Bull. Soc. Bot. Belg., 31, 69.

The American Ashes.—George B. Sudworth.—Hardwood, 1, No. 10.

Muira Puama.—H. Kleesattel.—Ber. d. Pharm. Ges., 1893, 67.

Olive Growing and Oil Pressing in Morocco.—Chem. and Drug., 1893, 815. (Statistics for 1892.)

Olive Oil.—See Olea.

Olive and its Fatty Substances—On the Formation of.—L. Paparelli. Review of history of, as well as some experiments by the author.—Pharm. Era, 1892, 197.

Olive Oil in France.—Statistics in Chem. and Drug., 1892, 902.

Olive Oil in Italy.—An account of its manufacture.—Mineral Water Trade Journal; Pharm. Jour. (Aus.), 1892, 218.

Orchideæ.

Alkaloids of the Orchideæ.—E. de Wildeman affirms the presence of alkaloids in Dendrobium molle and other species of the genus. He finds in the aerial roots, stem, parenchyma of leaves, petals, and in the ovary, crystalloids similar to those found in Epiphyllum. They are insoluble in alcohol, and micro-chemically indicate an alkaloid. They occur in especial abundance in the cells which are in a state of active division, in

the epiderm and in the hairs. Also in some cells containing raphides. In D. Ainsworthii they were found in the leaves and in the petals.—Bull. Soc. Bot. Belge de Micros., 1892, 101; Pharm. Jour. Trans., 1892, 48.

Angraecum fragrans Du Petit Thonard, or Faham.—L. Planchon. N. Montpel. med., 1892, 903, 931.

Faham Tea.—The leaves of Angræcum fragrans, Thon., yield an odoriferous principle, which imparts to them a persistent vanilla-like odor.—Kew Bull., 68, 181; Phar. Jour. Trans., 1892, 183.

Hardy Lady's Slippers.—With a colored plate of Cypripedium acaule and C. pubescens.—The Garden, 42, 386.

Vanilla ensifolia, Rolfe.—Description of this new species by Mr. Rolfe, in Kew Bull., 66, 141; Phar. Jour. Trans., 1892, 85.

Vanilla—Notes on the History of.—Chem. and Drug., 1892, 807.

Vanilla Plant—Epiphytic Character of the.—A reply by "The Charles E. Hires Company" to Mr. Beringer's paper (see Proc., 1892), that the vanilla plant is a parasite and not an epiphyte. Prof. Maisch shows their error and the correctness of Mr. Beringer's statement, by quoting the literature upon the subject. The account given by the company, likewise, shows that the plant is epiphytic, and when cut above the ground derives the nourishment from the atmosphere, but not from the sap of the tree as erroneously stated.—Am. Jour. Pharm., 1892, 554, 557.

Vanilla Disease.—Specimens of V. planifolia, Andr., from the Seychelles, have been diseased by a microscopic fungus, Calospora vanillæ.—Phar. Jour. Trans., 1892, 81; from Kew Bulletin, 65, 111. (See also Phar. Jour. Trans., 1892, 349.)

Vanilla Pods—The Method of Preserving.—(Am. Drug., 1892, 467).—Some time ago attention was directed to a new mode of preserving vanilla pods, adopted in Reunion, and consisting in the steeping of the green fruit, when freshly gathered, in alcohol. This process was discovered in 1888, by three gentlemen of St. Denis, the capital of Reunion. Their names were Potier, the director of the botanical gardens; Chatel, a pharmacist, and Daude, a planter. Museum specimens of green pods in alcohol were sent to the Paris Exhibition of 1889, but until now the process has not been carried out on a commercial scale. It is stated, however, that it is the intention of some of the Reunion growers to ship a considerable portion of this year's crop packed in casks of alcohol. The rationale of the alcohol process is based upon the view that in the green vanilla pods the vanillin, or odorous principle, does not exist in the free state, but in the form of a glucoside insoluble in alcohol, and that, therefore, the pods when landed in Europe will be richer in vanillin by about 40 per cent. than they would be had they been dried in the Tropics.

Vanillin and Benzoic Acid.—Schimmel and Co. Crystals of benzoic

acid can be distinguished microscopically from those of vanillin, the former being needle-shaped, the latter tabular. By extracting with a dilute solution of carbonate of sodium, acidulating with sulphuric acid, and adding a little zinc, the odor of bitter almond indicates benzoic acid.

Orobanchaceæ.

Epiphegus Virginianus.—Albert C. Koeppen. An analysis of fifty grams of the fresh drug collected in August, in the vicinity of Philadelphia, gave the following results:

	Per Cent.
Fat	0.48
Resin	0.31
Alcohol extract, containing tannin, crystalline organic acid, alkaloid and glucoside	9.32
Mucilage and sugars	1.90
Sodium hydrate extract	0.25
Hydrochloric acid extract	0.14
Lignin	0.28
Ash	16.91
Moisture	7.08
Cellulose and undetermined	63.33
	100.00

Am. Jour. Pharm., 1893, 274.

Palmeæ.

"*Coco de mer.*"—The origin and habitat of Lodoicea seychellarum.—Nat. Drug., 1892, 40.

Saw Palmetto.—Recapitulation of its properties, etc.—New Idea; West Drug., 1892, 455.

Papaveraceæ.

Opium Alkaloids.—See Alkaloids.

Bases of Papaveraceæ.—See Alkaloids.

Bocconia.—A study of the plant and alkaloid.—J. M. Lasso de la Vega.—Gaz. Méd., Mex., 1892, 367.

Opium and Morphine—Influence of Heat upon.—H. Hager points out that morphine in aqueous solution, warmed over 40° C., gradually absorbs oxygen from the air, and is converted in part into the milder or very feebly narcotic oxymorphine; at boiling heat, absorption of oxygen goes on much more rapidly. This change is of special significance in its bearing upon the preparation of sterilized solutions of alkaloids and that of the extract of opium. Evidently the higher the temperature at which the evaporation is carried on, the milder will be the physiological action of the product. Hager further suggests that for children and delicate women

an opium of reduced strength (Opium mitigatum) might be made by mixing the 10–11 per cent. drug with one and a half times its weight of water, heating with constant stirring in a water-bath to 35°–100° C. until the added water has evaporated; this is reduced to powder and preserved in well-closed vessels protected from light.—Pharm. Zeit., 1893, No. 32; Bull. Pharm., 1893, 214.

Smoking of Opium—Chemical Investigation of.—By Henry Moissan (Compt. Rend., 115, 998). The author has examined the smoke of opium in order to see if its physiological action is due to morphine or to distillation products. When good chandoo is heated to about 350° or less, only fragrant products are volatilized with water containing some morphine. The remains in the opium pipe are gathered together and sold as "dross" to the smoker. This second product yields such poisonous substances as pyrrhol, aceton and hydropyridin bases.—Amer. Drug., 1893, 137.

The Smoke of Opium—Physiological Investigation of.—N. Grehaut and E. Martin found that opium smoke exercised no perceptible action upon dogs.—Compt. Rend., 115, 1012–1014.

Opium Poppy—Notes on its Cultivation, Collection and Assay.—Brit. and Col. Drug.; Nat. Drug., 1892, 108.

Opium—Japanese.—Uyeno has examined four samples of opium from the province of Mije, and gives the following data for the relative amounts of morphine and narcotine (Apoth. Zeit., vii, 454; Pharm. Jour. and Trans., 1892, 262):

	Morphine.	Narcotine.
1	11.727	9.258
2	0.713	9.260
3	10.044	11.052
4	12.942	7.294

The Opium Question.—Cayley.—Lancet, 1892, 832.

Opium—The Trade in.—P. L. Simmonds. The commerce and consumption of opium in England, Persia, Turkey, India, China, Canada and Australia.—Bull. Pharm., 1893, 64.

Manufactured Opium before the Federal Law.—Editorial, Nat. Drug., 1893, 184.

Opium Trade of China.—Wenchow, Kiungchow, Ichang, Formosa.—From Consular Reports in Pharm. Jour. Trans., 1893, 1028–1030.

Persian Opium in China.—The consular report from Tainan shows that there is a decreasing importation of Indian opium, while that of the Persian variety is greatly on the increase.—Phar. Jour. and Trans., 1892, 7; Consular Report, No. 1061.

Opium Dealing in British Guiana.—Chem. and Drug., 1893, 120.

Indian Opium.—B. H. Paul and A. J. Crownley. On several questions that need to be solved before the substitution of Indian for Turkey opium can be looked upon as feasible.—Phar. Jour. Trans., 1892, 505.

Opium Trade in India.—Statistics on total quantity of Bengal Excise Opium manufactured at Patna and Ghazipur, including Malwa opium.—Chem. and Drug., 1893, 438.

Opium Growing in British India.—Chem. and Drug., 1893, 472.

Opium and Poppy Seed in Salonica.—Statistics.—Chem. and Drug. 1892, 908.

Opium—Turkish.—The purity maintained.—Chem. Drug., 1893, 235.

Papayaceæ.

The Papaw Tree.—Phar. Jour. Trans., 1893, 789; Consular Rep., 266, 1892.

Papoid—Its Manifold Uses.—W. C. Wile.—N. Eng. M. Month, 1892–93, 323.

Papaw Juice.—J. H. Hart notes that there is a growing demand for the concrete juice of the *Carica Papaya*. The method of preparation, as he decribes it, is simplicity itself, since it is only necessary, with a sharp knife, to scar or line the unripe fruit daily about a quarter of an inch deep. The juice as it escapes is then caught and dried upon sheets of glass.—Phar. Jour Trans., 1892, 442; from Agric. Rec., 7, 59.

Papoid.—F. Woodbury, N. Y. Med. Jour., 1892, 15; F. A. Thompson, Bull. Pharm., 1892, 556.

Papoid Digestion.—R. H. Chittenden. Papoid is prepared from various parts of Carica Papaya. The author sums up the results of his extensive experiments as follows:

1. That papoid is a true, soluble, digestive ferment or mixture of ferments of vegetable origin.

2. That it has marked proteolytic action in acid, alkaline, and neutral solutions and in the presence of many chemicals, antiseptics, and therapeutic agents.

3. That it has a peculiar softening and disintegrating action on proteids, and that its general proteolytic action is that of a genuine digestive ferment, similar to the ferments of animal origin.

4. That it has a certain amount of amylolytic, or starch-dissolving power.

5. That it has a marked rennet-like action upon milk, and a pronounced digestive action upon milk-casein.

6. That it exerts its peculiar digestive power at a wide range of temperatures.

7. That the ordinary conditions of health and disease in the stomach and intestine are not liable to check its action, while certain possible conditions may accelerate it.—Trans. Conn. Acad., 1892.

——— A. Dixon says (Doctor's Weekly) that Herschell and Woodbury have pointed out that papoid has greater digestive power than either pepsin or pancreatin, and can be used when pepsin is contraindicated or powerless. "Experience has proven this to be true, and it may be stated that papoid under the conditions indicating the use of animal pepsin will produce *some* results, while animal pepsin under the conditions indicating the use of papoid will produce no results whatever. It may be further stated that papoid under papoid conditions produces greater results than animal pepsin under pepsin conditions! Papoid is indicated in any case where there is a deficiency of the gastric juice, no matter from what cause; in gastric catarrh, acute or chronic; in cases of anæmia and general debility, productive of deficient blood supply; in chronic alcoholism, which is always accompanied by an excess of unhealthy mucus in the alimentary canal; in the vomiting of pregnancy, and all irritable conditions of the stomach associated with pain and vomiting. In duodenal and intestinal indigestion, papoid is infinitely superior to pancreatin. These statements are based upon results from practical experience, and from records that cover both negative and positive results."—Amer. Drug., 1892, 132.

Carpaine as a Substitute for Digitalis.—By v. Oefele. Carpaine produces neither irritation nor abscess when injected subcutaneously. The author regards it as the only substitute for digitalis that can be used hypodermically without occasioning such disturbances. When applied internally, it appears to possess no advantages over other digitalis substitutes.—Merck's Bulletin, May, 1892, 279; Phar. Jour. and Trans., 1892, 1.

Pedaliaceæ.

Oil of Sesame.—See Olea.

Sesamin.—James F. Tocher. A continuation of the work on sesame oil, which the author began more than a year ago. Sesamin is extracted from the oil by means of acetic acid and alcohol. By purification by means of recrystallization, he obtained a product which on combustion proved it to have the composition expressed by the formula $C_{18}H_{18}O_5$. At 20° C. 100 grains of alcohol dissolve 0.27 grain sesamin, and 100 grains of boiling alcohol dissolve 8.07 grains. The specific gravity of sesamin was formerly found to be 1.305. The ordinary methods employed to determine the constitution of organic compounds gave no satisfactory results as regards sesamin; the evidence indicated that it did not correspond to any known substance. It had been shown to be devoid of acid or basic properties, and, judging from its behaviour with alcoholic potash, nitric acid, etc., it might come under the term "neutral resin" or resin anhydride as used by Dragendorff to describe oxygenated bodies (occurring along with resin acids) which were insoluble in alkalies. As he had pointed out in his

previous paper, sesamin assumed a green and afterwards a bright-red color in contact with nitro-sulphuric acid. A similar coloration was produced on sesame oil by nitro-sulphuric acid, as pointed out by Behrens—a reaction which no other oil exhibited, so that undoubtedly the cause of the coloration was sesamin. Owing to the minute proportion of sesamin present in the oil (.04 to .06 per cent.) he had not been able to extract a sufficient quantity to make a thorough investigation into its constitution.—Chem. and Drug., Feb. 18, 1893; Phar. Jour. and Trans., 1893, 700.

Phytolacca decandra—A Proximate Principle from.—Henry Trimble. A principle was obtained by E. G. Eberhart from the poke root, who expressed the opinion that it resembled the phytolaccic acid of Terreil (Amer. Jour. Pharm., 1881, 325). Prof. Trimble has made an analysis of it, and finds it to correspond to the formula $C_{54}H_{82}O_{23}$. He believes it to be of the class of saponins.—Am. Jour. Pharm., 1893, 273.

Phytolacca decandra—Constituents of the Fruit of.—F. Haverland.—Inaug. Dissert. Erlangen.

——— *The Coloring Principle of.*—Herman Harms. A proximate analysis of the berries dried at 100° gave the following results:

		Percentage.
Petroleum ether extracts		.012
Stronger ether "		.027
Absolute alcohol "		.024
Distilled water extracts:		
Mucilage	2.74	
Dextrin	3.52	
Glucose	8.09	
Saccharose	1.46	
Carbohydrate	1.13	
		16.94
Sodium hydrate solution:		
Pectin and albuminoids		1.47
Dilute hydrochloric acid extracts:		
Pararabin		1.28
Residue (chiefly seeds)		76.32
Ash		.05
Loss		2.977
		100.000

The seeds were subjected to a partial analysis. He obtained a principle resembling the phytolaccin of Claussen.

The Coloring Principle.—Several methods of obtaining this principle by precipitation were tried with negative results, but the following seemed to yield the purest product. "The juice of the ripe berries was treated with an equal volume of alcohol and the mixture filtered after 24 hours. The filtrate after agitation with stronger ether was evaporated in a vacuum, the

residue dissolved in 75 per cent. alcohol and filtered. The filtrate was evaporated under reduced pressure and yielded a bright purplish-red powder." This powder was insoluble in absolute alcohol, ether and chloroform, but was readily dissolved by water, yielding a bright red or purple solution, according to the strength of the solution. The aqueous solution was turned yellow by alkalies and reddened again by the addition of an acid.

On treating the aqueous solution with an excess of Fe_2Cl_6, or chlorine water, it was decolorized; the same result was obtained by strong oxidizing as well as reducing agents. Boiling the solution had no effect, but with addition of HCl and continued heat, the solution was gradually decolorized. No change was caused by alum, cream of tartar or stannous chloride; subacetate of lead produced a light purplish precipitate.—Am. Jour. Pharm., 1893, 1.

Piperaceæ.

Cubebs—Spurious.—Mr. Holmes again directs attention to the cubebs of commerce which are spurious. The variety, which appeared in English commerce some years ago and caused nausea and diarrhœa with other symptoms of poisonous action when taken internally, has been identified by means of herbarium specimens sent by Mr. L. Wray, Jr., curator of the Perak Museum, as Piper ribesioides, Wall. It does not, however, possess any mace-like odor, although Mr. Wray states that it gives a brownish color with sulphuric acid. This plant should be examined physiologically, as it may have properties which would render it of service as a drug. Our present knowledge of cubebs and the substitutes for it met with in commerce may be summarized as follows:

The cubeb plants cultivated in Java are of three kinds. These are in all probability *Piper Cubeba, L.f., Piper crassipes*, Korth., and a third variety, with fruits having a macy odor.

Piper crassipes may be distinguished by its larger size, long, slender, flattened stalk, and its bitter taste. It does not give a crimson color with sulphuric acid.

The cubeb with a macy odor resembles the true cubeb in shape and size, but is grayer, more wrinkled, and does not give a crimson color with concentrated sulphuric acid.

The fruits of *Piper Lowong*, Bl. (*Cubeba Lowong*, Miq.) are stated by Flückiger to be extremely cubeb-like ("Pharmacographia," 2d ed., p. 58); and as this species is a native of Java, it is quite possible that it may yield the cubebs with a macy odor. I have not, however, been able to find in either of our national herbaria a specimen of this species in mature fruit.

The fruit of *Piper ribesioides* is collected in the Selama district of Perak in small quantity, but there is no evidence that it enters into English commerce.

In the report of the Buitenzorg Botanic Gardens above quoted, it is stated that the cubeb plant is more easily propagated by layers than by slips.* In making the layers the stems are laid on the ground and covered with only a little earth. From these prostrate stems numerous erect shoots arise. It is found that quick-growing trees must not be used as supports, as these are apt to break the cubeb stems by their rapid growth. When raised from seed the young plants are germinated in pots in the shade or under glass. but when the leafy stems are developed they are planted out in the full light, although the plant is a native of the bushy woods. The cubeb plant does not afford a large yield of fruit.—Pharm. Jour. and Trans., Aug., 1892 ; Am. Jour. Pharm., 1892, 494-498.

Daphnidium Cubeba, Nees.—E. M. Holmes has identified the fruit of so-called Daphnidium Cubeba as identical with specimens of Tetranthera citrata procured by Dr. Van Eeden, except in its stronger verbena-like taste. The layer of sclerogenous cells of the testa in *Tetranthera citrata* is composed of extremely narrow cells without a recognizable lumen, whilst that of *Piper Cubeba* is formed of large oblong cells having a well-marked lumen. It may be assumed, therefore, as proved that the so-called *Daphnidium Cubeba* of commerce must in future be referred to *Litsea citrata*, Bl. ("Bijdrag," p. 565), but that the identity of that plant with the *Laurus Cubeba* of Loureiro is uncertain.

It is further of interest to remark that the fruits of *Litsea citrata* are identical with the "citronelle fruits" distilled by Messrs. Schimmel & Co., under the name of *Tetranthera citrata*, which are stated by them to yield citral, the flavoring principle of oil of lemon, to the extent of 30 per cent. of the oil. Citral has an odor between that of lemon and verbena, and it is remarkable that Mr. J. O. Braithwaite, in his examination of the fruits of *Daphnidium Cubeba* (Pharm. Jour. [3], vol. xvii, p. 231) obtained a volatile oil having an agreeable odor between that of the oils of lemon and verbena. This odor and flavor become weaker when the fruits are kept, and this fact may perhaps account for the similarity of the "citronelle fruits" with those of *Daphnidium Cubeba* having hitherto remained unnoticed.—Am. Jour. Pharm., 1893, 303 ; from Pharm. Jour. Trans., 1893, 846.

Piper Ribesioides—An Examination of.—Edward Brooke. A chemical examination of the spurious cubebs received by E. M. Holmes.

* This is perhaps more easily understood when it is stated that the cubeb is a climbing plant, attaching itself to its support by roots which are formed near each leaf base, and one side of the stem, as in ivy.—E. M. H.

The following tables are a summary of the results obtained:

Piper Cubeba.	Piper Ribesioides.
Raw Drug.	
No reaction for iron in aqueous solution or acid solution.	Copious reaction for iron in dilute acid after an hour.
A decoction gives only a slight reaction with iodine.	Iodine in cooled decoction indicated a considerable quantity of starch.
Ash.	
8.01 per cent., which contained .081 per cent. of Fe_2O_3.	4.87 per cent., which contained 3.58 per cent. of Fe_2O_3.

Obtained from Fifteen Grams.

	Per cent.	
Petroleum extract	19.85	Vol. oil 6.28 per cent., non vol. fats and fixed oil 13.57 per cent.
Ether extract	3.08	Two resins: one neutral, soluble in alcohol, 2.06 per cent.; one acid, insoluble in alcohol, 1.02 per cent.
Alcoholic extract	1.48	Chiefly extractive.
Aqueous extract	7.64	Coloring matter and extractive. No glucosidal matter, and free from sugar.

	Grams.
Total	32.05
Residue	67.26
Waste	.69
	100.00

The moisture at 110° C. was 1.75 per cent.

By distillation with water scarcely one per cent. of oil was obtained owing to the difficulty with which it distilled. This was of a pale straw color with pungent and rather disagreeable odor, somewhat like dried hops. It is soluble in alcohol, chloroform, and ether.

The following comparative tests were applied to the volatile oil.—(Vide Braithwaite on Oil of Daphnidium Cubeba, Pharm. Journ., [3], xvii.)

Reagent Employed.	Vol. oil P. ribesioides.	Vol. oil P. cubeba.
Sol. bromine in chloroform 1 to 20.	Yellow.	Yellow to violet.
Sulphuric acid in chloroform.	Brown red turning to violet.	Same.
The same with excess of water.	At first colorless, then violet.	Same.
Hydrochloric acid.	Slight violet.	Same.
Nitric acid.	Brown with violet edges.	Same.

—Phar. Jour. Trans., 1893, 734.

Pittosporeæ.

Pittosporum—Notes on the Exudations Yielded by Some Australian Spe-

cies of.—J. H. Maiden. A valuable paper on the chemical and physical properties of the gums and gum resins yielded by some species of Pittosporum.—Phar. Jour. Trans., 1892, 59, 79.

Plantagineæ.

Plantago major.—C. E. Sonnenburg gives an account of the constituents, properties and preparations of this plant.—Drug. Circ., 1893, 51.

Polygalaceæ.

Polygala Alba, Nuttall.—L. E. Sayre. A note relating to the abundance of Polygala alba in Kansas, as ascertained in a discussion upon the subject at a meeting of the Kansas Academy of Science.—Am. Jour. Pharm., 1892, 553.

Polygonaceæ.

Canaigre Tannin.—Henry Trimble and J. C. Peacock. Canaigre is the tuberous root of Rumex hymenosephalous.

The roots vary much in size and appearance, according to whether they

FIG. 59.

Canaigre Tannin.

are green or dry. The accompanying illustration is from a green root, one-half natural size. It and a number of others were received September 14, 1892, from C. B. Collingwood, of the University of Arizona, who furnished the following interesting information:

"It is impossible to make a satisfactory division into roots one, two and

three years old from wild plants. Differences of soil, amount of water, etc., cause a wide variation in the appearance. These roots were planted in July, 1891, in our plot, which happens to be mesa soil of rather heavy gravelly loam, although too hard and stiff for this plant, which seems to prefer almost pure sand.

"They received some irrigation, but did not show above ground until October. During the winter they grew steadily, but slowly. About March 1st they started into rapid growth, which continued until flower and seeding occurred in April; seeds very sparingly, but more plentifully than in native state. The percentage of tannin has been steadily increasing. The roots now show signs of sprouting, and will be gathered and replanted. The yield from this plot was about seven tons to the acre, but on account of unfitness of soil is not a fair test. Experiments on other soils indicate that we may safely expect fifteen to twenty tons per acre of green roots.

"The last samples analyzed, August 31st, contained in green root 66 per cent. moisture at 100° C., 16.18 per cent. total extract, 11.46 per cent. tannic acid (by hide) 70.98 per cent. purity. This would show in the dry roots, which contain 8 per cent. moisture, 44.66 per cent. total extract, 31.62 per cent. tannic acid, with 70.98 per cent. purity."

The authors give in detail their mode of preparation and purification of this tannin. The tannin, porous, yellow, readily soluble in water, and free from sugar, gave in a one per cent. solution the following reactions:

Ferric chloride and Ammonium hydrate	green ppt. / brown ppt.
Ferrous sulphate	no change.
Lead acetate	yellowish ppt.
Gelatin and alum solution.	yellow ppt.
Tartar emetic and Ammonium chloride.	no change. / clouding, becoming a flocculent ppt.
Potassium bichromate	greenish-brown ppt., darkening.
Fehling's solution	reduced.
Ammoniacal silver nitrate	reduced.
Calcium hydrate	light pink ppt., turning red and brown.
Bromine water	first yellow, then brown ppt.
Ammonium molybdate	no change in color.
Cobalt acetate	yellow ppt.
Uranium acetate	crimson color, upon standing a red-brown ppt.
Ammoniacal picric acid	no change in color.
Ferric acetate	green ppt.
Copper sulphate and Ammonium hydrate	no change. / brown ppt., liquid, brownish-green.

The Action of Heat.—The tannin heated with glycerin gave the characteristic reactions for catechol.

Action of Acids.—They obtained a red insoluble substance and a crystalline body giving reactions for protocatechuic acid.

Action of Fused Alkalies.—Effervescence and a peculiar odor resembling that produced in making soap from rancid fat. A solution gave reactions indicating protocatechuic acid.

Acetyl Derivative.—At about 95° C. on a water-bath, decomposition took place.

The tannin was submitted to combustion with the following results:

(I) .1629 Gram tannin gave .3488 Gm. CO_2 and .0792 Gm. H_2O.
(II) .1376 " " .2912 " " .0652 "
(III) .1815 " " .3875 " " .0872 "

	I.	II.	III.	Average.
C.....	58.39	57.71	58.22	58.10
H.....	5.40	5.26	5.33	5.33
O.....	36.21	37.03	36.45	36.57

The result of these combustions indicates that canaigre tannin belongs to a group, of which the tannins from mangrove and rhatany are typical representatives.—Am. Jour. Pharm., 1893, 161.

Canaigre.—C. B. Collingswood. A pamphlet devoted entirely to Canaigre under five headings, as follows: 1. Historical Sketch. 2. Botanical Characteristics. 3. Chemical Examination. 4. Cultivation. 5. Conclusions.—Bull. No. 7, Arizona Agric. Exp. Station.

Polygonum bistorta.—A contribution to the pharmacology and chemistry.—K. F. von. Stein.—Moscow, 144 p. (Abstract, Pharm. Post, 1892, 1218).

Bessarabian Rhubarb, examined by J. Mörbitz, yielded 0.85 per cent. of pure chrysophanic acid and 0.25 per cent. of pure emodin; attempts to isolate cathartic acid failed. The powdered root taken in doses of as much as five grams by different persons gave negative results as a cathartic.—Pharm. Ztschr. f. Russl., 1893, 241; Am. Jour. Pharm., 1893, 335.

Rumex—Revision of the Species of, occuring North of Mexico. Wm. Trelease.—Third Ann. Rep. Missouri Bot. Gard., 74; plates, 13. The author recognizes 20 species within this area.

Ranunculaceæ.

Adonite.—See Alkaloids, Glucosides, etc.

Anemonin.—See Alkaloids, Glucosides, etc.

Adonitol, a new Pentitol.—E. Fischer gives the results of his own experiments as well as Merck's description of the properties of the substance.—Ber. d. Chem. Ges., xxvi, 633.

Hydrastis Canadensis in the Vomiting of Pregnancy.—Dr. Fedorow (Rev. de Thérap., 1892, 388) gives 20 drops of the fluid extract of

hydrastis four times a day in cases of vomiting of pregnancy. The drug acts by reducing the arterial pressure, relieving the congestion of the uterus, and by calming the excitability of the vaso-motor centres of the gastro-intestinal tract.—Am. Jour. Pharm., 1892, 515.

Hydrastis Canadensis—Assay of Drug and Fluid Extract.—F. A. Thompson. 10 grams of the drug in a moderately fine powder is exhausted with strong alcohol by hot re-percolation, requiring 2 or 3 hours, percolate cooled and diluted to 100 C.c. with same menstruum. 25 C.c. of this tincture is placed in a suitable flask, 1.3 C.c. HCl (U. S. P.), 0.2 C.c. H_2SO_4, and 12.5 C.c. concentrated ether added, and the mixture allowed to stand 24 hours in a cool place, with frequent shaking. At the end of this time transfer the crystals to counterpoised filter papers, washing them with a mixture of equal volume of concentrated ether and strong alcohol until filtrate gives no acid reaction. Dry crystals at 105° C., weigh, and multiply weight by 0.9017 to obtain the amount of berberine alkaloid, and then multiply this result by 40 to ascertain the percentage.

The filtrate from berberine is rendered nearly neutral, evaporated to a small volume and mixed with 8 or 10 grams of sawdust (previously treated with acid, water and alcohol to remove extractive matter). The mixture is dried, placed in a suitable flask, and 100 C.c. of a modified Prollius mixture (ether, 250 C.c.; chloroform, 100; alcohol, 25; and conc. ammonia, 10 C.c.) added. After maceration and frequent shaking for several hours, 50 C.c. of ethereal liquid is evaporated to dryness, re-dissolved in acid, water and ether. Reprecipitate alkaloid with ammonia water, extract with ether. Evaporate ethereal solution Dissolve residue in 10 C.c. $\frac{n}{10}$ H_2SO_4 (a small amount of ether facilitates the solution of the alkaloids), add 20 or 30 C.c. water, 2 drops of cochineal tincture 1 : 10 and determine free acid by titration with $\frac{n}{100}$ NaOH solution. Each C.c. of $\frac{n}{100}$ H_2SO_4 neutralized represents 0.00383 hydrastin; this multiplied by 40 equals the percentage in the drug. The following is the average of the author's results on the examination of 9 samples of drug: Per cent. berberine calculated from dried (105° C.) berberine muriate, 3.48; hydrastine by weight, 2.47 per cent.; hydrastine by titration with $\frac{n}{100}$ H_2SO_4, 2.27 per cent. These results are much higher in alkaloids than any recorded. The author applies these methods in the examination of Fld. Ext. Hydrastis U. S. P., and that made without alcohol.—(See Proc. Mich. State Pharm. Assoc., 1893.)

Hydrastine.—See Alkaloids, etc.

Rhamneæ.

Cascara—Active Principle of.—M. Leprince has isolated from the bark of Rhamnus Purshiana a new body, which he regards as the active principle of the plant. He proposes to name this substance *cascarine*. It occurs in microscopic, prismatic needles, of an orange-yellow color. The tint varies with the degree of hydration. They are inodorous, tasteless, and

soluble in potash and other alkaline solutions, to which they impart a dark reddish-purple coloration. They are insoluble in water, soluble in alcohol and alcohol-ether, but less so in chloroform, formula being $C_{12}H_{10}O_5$.—Compt. rend., cxv, 286; Phar. Jour. and Trans., 1892, 182.

Root Galls on Ceanothus Americanus and Alnus Serrulata.—By George F. Atkinson.—Bull. Torr. Club, 1892, 171. (Also Bot. Gaz., xiv, 232.)

Cascarine and Rhamnoxanthine Identical.—T. L. Phipson.—Compt. rend., Oct. 3, 1892.

Cephalanthin.—See Alkaloids, Glucosides, etc.

Rhizophoreæ.

Rhizophora Mangle, L., contains much tannin. A sample extracted with hot water yielded a light reddish-brown infusion. On analysis the total extract was determined at 33.04 per cent., of which tannin constituted 25.10. Boiling with dilute acid resulted in the conversion of the tannin into an insoluble "red" (phlobaphene). Only a trace of gallic acid was indicated in the solution. On heating the tannin to 200° C. the same effect was produced. It is a catechol tannin, somewhat resembling that of mimosa bark, but not identical with it. Its reactions differ from those of generally known tannins. Specimens of the concentrated juice of the bark, in block form, have been received at Kew, but it is reported to compare unfavorably with Gambier at the present time.—Kew Bull., 70, 227; Phar. Jour. Trans., 1892, 345.

Rosaceæ.

Jordan Almonds.—Phar. Jour. Trans., 1893, 808.

Cherry Juice in Raspberry—Detection of.—Wimmer.—Pharm. Ztg., 37, 713; Zeitschr. f. Anal. Chem., 1893, 110.

Cherry Laurel—Occurrence of Mannitol and Sorbitol in the Fruit.—Vincent and Delachanal.—Compt. rend., cxiv, 486.

Cherry Tree Gum.—On account of the difficulty in securing the complete solution of cherry tree gum in water, its use as a substitute for gum arabic has been limited. M. Garros has been experimenting on this substance, however, and finds that he can dissolve and decolorize it easily by adding to the water used a few drops of sulphuric or hydrochloric acid. A gentle heat is required, preferably that from a stove maintained at 40° to 50° C., and should be applied for twenty or twenty-five minutes. The solution thus obtained is described as being white and viscous, whilst comparing favorably with the product of gum arabic.—Rev. inter. des fals.—Phar. Jour. Trans., 1892, 350.

Prunus Laurocerasus.—The fruit, according to Camille Vincent and Delachanal (Compt. rend., cxiv, 486) contains mannit and sorbit. The bruised cherries were allowed to ferment, the liquid treated with lead

acetate, freed from lead and concentrated to a syrup, from which most of the mannit crystallized, more being precipitated by the addition of alcohol. The remaining liquid, by a complicated process, yielded sorbit identical with that obtained from mountain-ash berries.—Am. Jour. Pharm., 1892, 467.

Prunus Padus—Hydrocyanic Acid in.—M. Tuma (Zeits. Oest. Apoth. Ver., 1892, 330) has carried out an investigation with the object of determining whether the young buds of this plant are richer in hydrocyanic acid than the mature leaves. The young buds gathered in April were carefully rubbed down, whilst quite fresh, in a mortar with water, then quickly transferred to a retort, sulphuric acid added, and the mixture distilled. The distillate was freed from the essential oil which came over, by filtration. The hydrocyanic acid was then estimated both volumetrically and gravimetrically. It was found that the young buds contain 0.050 per cent. of hydrocyanic acid, whilst only 0.022 per cent.—less than half—was found in the mature leaves plucked at the time of flowering.

Amygdalus persica, Prunus armeniaca, P. domestica, P. avium.—A microscopical examination of the kernels of the seeds.—C. Micko, in Zeits. Oest. Apoth. Ver., 1893, 2 and 21.

Gillenia stipulacea, Nuttall.—By G. L. Curry. Analysis of the subterranean organs gave the following results: The ethereal liquid on evaporation gives a yellowish crystalline residue, which proves to be a glucoside, being colored red by sulphuric acid, yellow by nitric acid, and deepens the color of chromic acid. The author proposes the name *gillein* for this body, which in the dose of ¼ grain was observed to produce nausea approaching emetic action. A tannin was obtained, producing a greenish-black color with a solution of ferric chloride. The aqueous layer of the second ethereal treatment on evaporation gave an amorphous residue which was soluble in water, sparingly so in alcohol and ether, and presenting all the reactions of a glucoside, for which the name *gillenin* is proposed. It possesses a bitter taste, gives no reactions with iron salts or gelatin, and no color reaction with the acids above mentioned.

These principles are evidently different from the *gillenin* obtained by W. B. Stanhope from *Gillenia trifoliata* (see Amer. Jour. Pharm., 1856, p. 200), which was colored blood-red by nitric acid, and green by chromic acid.

In comminuting the Gillenia stipulacea, the dust arising from it caused, like that of Cephaelis Ipecacuanha, dryness of the nose and throat, and left a slight congestion of the larynx, which did not wear off for about twenty-four hours. A convenient form of administration will no doubt be secured in the tincture, made 10 per cent. in strength with 50 per cent. alcohol. Another form, and the one more usually employed, is the decoction. The mention by Barton of this species being the more valuable,

as well as its remote use by country folk, would seem to indicate its medicinal value, and would warrant a trial by the medical fraternity.—Am. Jour. Pharm., 1892, 513; from Am. Practitioner and News, 1892, 294–298.

Rose Crop of 1892.—Chem and Drug., 1892, 60.

Oil of Rose.—See Olea.

Sorbus Aria—Use of Fruit in Asia Minor.—Duchesne (Rép. de Pharm., 1892, 227) calls attention to these fruits, which are about the size of a small nut and are known in Asia Minor under the name of idé. The inhabitants make use of the pulp of the fruit in the place of "farine lactee" in the feeding of infants, the pulp being mixed with water or milk. Gautrelet analyzed the fruits, his results being as follows: The envelope and kernel make up about one-half of the fruit. The pulp contains glucose 11.44, sorbine 13.56, nitrogenous matter 6.85, cellulose 6.05, fat 0.50, carbonates, chlorides and phosphates of alkaline earths 3.41, water, 8.00, the percentages being taken on the whole fruit.—Am. Jour. Pharm., 1892, 403.

Rubiaceæ.

Alkaloids of Cinchona.—See Alkaloids.

Cinchona Bark.—According to Schäfer the corky layer of S. A. Calisaya bark contains quinine equivalent to 2½ per cent. of quinine sulphate. The Java bark contains the equivalent of 2 per cent.—Chem. and Drug., 1893, 467. A review by Flückiger in Zeits. Oest. Apoth. Ver., 1893, 1.

Cinchona Cultivation in India.—The Darjeeling factory produced during the year 4,031 lbs. of cinchona febrifuge and 3,789 lbs. of sulphate of quinine. The manufacturing operations were conducted entirely by the fusel oil process, and another year's experience has increased the confidence in the simplicity and efficiency of the system. The quinine has been shown by repeated analysis to be of the highest possible purity. In the government plantations, in the Nilgiri Hills in Madras, there were at the end of the year 52,000 more trees than the previous year. Experimental plantings of jalap and ipecacuanha are doing well at the cinchona plantations. In Coorg it is reported that the cultivation of cinchona is being gradually abandoned, owing to the low price of bark in the market and because the shade of the cinchona tree injures the coffee plants.—Board of Trade Journal; Phar. Jour. and Trans., 1892, 324.

——— in Jamaica.—Allan Eric.—Oil, Paint and Drug. Rep.; Drug. Circ., 1892, 153.

Cinchona Barks of Java.—Two samples of cinchona bark, taken from trees in the Government Gardens at Rioeng Goenoeng, Java, were recently analyzed and found to equal, respectively, 12.66 and 16.54 per cent. of quinine sulphate. These are exceedingly high percentages, and the pri-

vate planters in Java who buy their cinchona seed from the government want to know why it is that the best seed ever supplied to them yields trees of no higher quinine value than 7 to 8 per cent., with the exception of the seed from one government plantation, that of Gombourg, from which trees yielding 13.25 per cent. have been raised. It is also pointed out that the richest government cinchona bark hitherto brought to market has not exceeded 9½ per cent. quinine sulphate, and there seems to be an unpleasant impression that the present director of the government gardens (who is soon to be superseded) has systematically kept the richest barks from the market and the best seed out of the hands of private cultivators.—Pharm. Rev., 1892, 154.

——— Flückiger in Chem. Zeit., 1892, 1470.

Quinine Factory in Java—The Projected.—Oil, Paint and Drug Rep., Nov., 1892.

Cinchonas Acclimated in Cordoba (Mexico) with the Same Species Abroad—Comparative Study of the.—M. I. y Hermosilla.—Bull. Pharm., 1892, 471; from El Estudio, May, 1891.

Quinine Factory at Naduvatam.—Description of the Government factory.—Chem. and Drug., 1893, 393.

Quinine—The Pioneer of German.—Riedel, in 1826.—Chem. and Drug., 1892, 907; from Pharm. Zeit.

Coffee Berry—Carbohydrates of.—E. E. Ewell. A contribution from the Chem. Lab. of the U. S. Dept. of Agric.; Am. Chem. Jour., 1892, 473.

Bogus Coffee on Sale.—P. C. P., Alumni Rep., 1893, 127.

Tea from Coffee Leaves.—These leaves have been but little used. Sowerby reckons that the number of persons using coffee leaves is about 2,000,000, as against those drinking coffee 110,000,000 and tea 500,000,000. It is noteworthy that the leaves of the coffee-tree contain 1.26 per cent. of caffeine, while the seeds contain but one per cent. Moreover, they possess an extraordinarily agreeable aroma, between that of tea and coffee, and reminding one of the cola nut.—Drog. Zeit., 1893, 179.

Coffee Extracts—Composition of.—A. Domergue, (Jour. Pharm. Chim.) Coffee "extracts" or "essences" differ in composition according to their mode of preparation. One method consists in distilling the roasted and ground coffee with water, and thus obtaining a colorless distillate the odor of which recalls that of coffee, and which is turbid with a little essential oil. The residue in the retort is filtered and mixed with the distillate, thus forming an "extract." It does not contain all the extractive matter of the coffee, and when diluted with the appropriate amount of water, is not the same color as the freshly prepared liquid. In order to remedy this defect, caramel is added, as well as strong alcohol, in order to preserve

it. The author has examined six extracts, the results of which are given below. Samples A and B were prepared in the laboratory:

	A	B	C	D	E	F
Ext. dried 100°C	13.7	17.6	41.01	27.2	30.1	19.26
Ash.....	0.61	0.79	4.3	3.1	1.4	1.83
Caffeine.....	0.106	0.105	0.060	0.040	0.05	0.096

The samples C, D and E have been colored with caramel.

Probably the best method of ascertaining the value of an extract consists in the determination of the caffeine, although it is to be noted that samples A and D only contained one-tenth of the amount of caffeine which is contained in an equal weight of coffee. No rule can be laid down as to what should constitute a normal coffee "extract."—Pharm. Era, 1892, 105.

Caffeine—See Alkaloids.

Gardenia—Resin of.—A resin from the leaves of G. Oudiepe Vieil., G. Aubryi Vieil., and G. sulcata Gaertn. of New Caledonia. Analysis by Heckel and Schlagdenhauffen in Rép. de Pharm., 1893, 145. It is very odoriferous, softens between the teeth, and gradually loses its yellow color, whilst imparting an agreeable flavor and increasing salivation. The resin is insoluble in cold water, but traces of gummy matters, tannin and albuminoids are dissolved when it is heated with the same liquid in a water-bath. Petroleum ether does not affect it, carbon bisulphide dissolves only a trace, but acetic acid, benzene, alcohol, ether, chloroform, acetone and acetic ether dissolve it, in the order given, in proportions varying from twenty-five to ninety-eight per cent. Its density is 1.102, and melting point 83°. By analysis its percentage composition was determined as follows: C, 52.96; H, 6.2604; O, 40.7796; thus nearly approaching that of quinotannic acid, taking this as C, 52.02; H, 5.82; O, 42.16. The other properties and reactions of the resin are said to point to a great analogy with the tannins generally. Besides being likely to be of use as a basis for a spirit varnish, it is said to have proved of value in the treatment of atonic ulcers of the legs.

Ipecacuanha Root.—The proportions of bark and woody portion in the three commercial varieties were found as follows:

	Bark. Per cent.	Wood. Per cent.
Rio best commercial root.....	77	23
Rio inferior commercial root.....	65.5	34.5
Carthagena commercial root	84	16
Carthagena select root	91.5	8.5
Singapore commercial root.....	91	9

Rio ipecacuanha was found to yield 0.53–1.45 per cent. emetine, depending upon the quality of the root; Carthagena ipecacuanha from 0.9–

1.85 per cent., the woody portion yielded 0.23 per cent. emetine; Singapore ipecacuanha gave 0.54 per cent. emetine. These assays were made by Kremel's method (see Am. Jour. Phar., 1892, 519).—Caesar & Loretz, Apotheker Ztg., 1892, 464; Am. Jour. Pharm., 1892, 568.

Ipecacuanha Root.—Analyses by Wimmel, in Jour. Pharm. Chim., 1893, 464.

Radix Ipecacuanhæ Deemetinisata Pulv.—For rectal administration Merck has placed upon the market a fluid 1 C.c. of which corresponds to 1 Gm. of deemetinized bark.—Merck's Ber., Jan., 1893.

——— Experiments by Kanthack and Caddy confirm the fact that this drug when deprived of its emetine possesses its full antidysenteric properties, without the drawbacks of depression, nausea, etc., caused by the crude drug.—Practitioner, i, 411.

Woody Ipecacuanha.—Sample in London.—Chem. and Drug., 1893, 741.

Spurious Ipecacuanha.—Mr. T. H. Wardleworth's paper describes *Ionidium Ipecacuanha*, and compares its structure with that of the root of genuine ipecacuanha.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 167.

Radix Antipertussica Brasiliensis.—Name also given to Radix Ipecacuanhæ.—Pharm. Zeit., 1893, 17.

Ipecacuanha—The Supply of.—Knowles and Foster in Chem. and Drug., 1893, 538.

——— *Deterioration of.*—Editorial, Chem. and Drug., 1893, 540.

Emetine.—See Alkaloids.

Randia Dumetorum, Lam.—(Gelaphal.) The fruit used in India as an emetic and dysenteric.—Pharm. Centralh., 1893, 240.

Rutaceæ.

Angostura Bark—Constituents of.—H. Beckurts and P. Nering have examined the bark of a Columbian rutacea, Cusparia trifolia, Engler (Galipea officinalis, Hancock). From the acid solution, four alkaloids, cusparine, cusparidine, galipine and galipidine, were separated. The separation of these was, however, exceptionally difficult, since their solubilities are very similar, and they were obtained pure only by means of (1) repeated fractional crystallization from their solutions in light petroleum; (2) fractional crystallization of the respective sulphates from hot aqueous solution. The total quantity of impure bases separated amounted to 2 per cent.

Galipine, $C_{20}H_{21}NO_3$, crystallizes from light petroleum in slender, lustrous, soft needles, which are pure white. It melts at 115.5°. It dissolves very readily in alcohol, chloroform, acetone, benzene and ether, but is only sparingly soluble in light petroleum. Its salts are yellow, and crystallize like the base.

Galipidine, $C_{18}H_{19}NO_3$, crystallizes from light petroleum in very light, silky, lustrous plates, which are pure white. It is readily soluble in alcohol, ether, benzene, ethyl acetate, and chloroform, less soluble in light petroleum; it melts at 111°. The salts are pale yellow, are readily soluble in hot water, and the solutions have a bitter taste.

Cusparine, $C_{20}H_{19}NO_3$, is comparatively easily separated from the other bases, owing to the sparing solubility of its salts. It melts at 89°, and is readily soluble in alcohol, ether, chloroform, acetone and benzene, more sparingly in light petroleum. Its salts are white and sparingly soluble in water, more readily in alcohol.

Cusparidine, $C_{19}H_{17}NO_3$, crystallizes from light petroleum in minute, slender, white needles. It melts at 78°, and dissolves readily in chloroform, alcohol, ether, and ethyl acetate, less readily in light petroleum. The salts are white and of bitter taste; they are less soluble than those of galipine and galipidine, but more readily than those of cusparine.

Angostura bark contains 1.5 per cent. of essential oil. It has an aromatic odor; the sp. gr. at 15° is 0.956, and it dissolves in ether, alcohol, chloroform, light petroleum, and glacial acetic acid; it reddens litmus. It is free from sulphur and nitrogen, and does not react either as a phenol, a ketone, or an aldehyde. Distilled under a pressure of 35 mm., it commences to boil at 153°; the greater part distilled between 200° and 220°; the last portions became solid when cooled with a mixture of sodium sulphate and hydrochloric acid.

The bitter principle, angosturin, is insoluble in ether, but soluble in alcohol. It is difficult to obtain pure. The addition of ether to a solution of angosturin in acetic acid precipitates it quite white. It melts at 58°.

The angostura bark contains a glucoside. It was not obtained pure. In solution it fluoresces and reduces Fehling's and other metallic solutions. —Arch. Pharm., 229, 591–617; Jour. Chem. Soc., 1892, 642; Am. Jour. Pharm., 1892, 410–413.

Oil of Bergamot.—See Olea.

Cyperus pertenuis, Lin., C. rotundus, Lin., called variously mothra, motha, mustaka, kurubindak, bradra and nagarmoostaka.—R. P. Banerjee, Med. Rep., Calcutta, 1892, 229.

Lemon Cultivation in Corsica.—F. J. Wulling.—Pharm. Era, 1893, 533.

Lemon—Oil of.—See Olea.

Lime Juice Industry.—Phar. Jour. Trans., 1893, 596; from Jour. Soc. Arts.

Limes and Lime Trees in the Leeward Islands.—Report by Vice-Consul Galbraith of Antigua.—Bull. Pharm., 1893, 36.

Lime Juice from Jamaica.—Statistics.—Chem. and Drug., 1893, 434.

Lime Juice—West Indian.—Statistics, Chem. and Drug., 1893, 563.

Murraya Koenigii—Schimmel and Co.—Pharm. Post, 1893, 208.

Blood Orange.—A. Barillé in the meeting of May 4th of the Société de Pharmacie de Paris (Rép. de Pharm., 1892, 277) calls attention to a sophistication of blood oranges. The zest of the samples examined was artificially colored with Biebrich scarlet or rocceline, two azo colors which, however, are non-poisonous.—Am. Jour. Pharm., 1892, 405.

Oranges—Analyses.—Pickell and Earle.—Florida Sta. Bull., No. 17, 1892.

Oranges and Lemons—Analysis of California.—Colby and Dyer.—Abstract, Jour. Chem. Soc., 1892, 1511.

Orange—Oil of.—See Olea.

Pernambuco Jaborandi.—E. M. Holmes describes a new species, Pilocarpus "Jaborandi."—Pharm. Jour. Trans., 1893, 1008; Consult, Ibid., v, 581.

Pilocarpus pennatifolius.—T. S. Hooker.—Curt. Bot. Mag., tab. 7235.

Pilocarpine.—See Alkaloids.

Xanthoxylum—The Conical Corky Spines of.—C. A. Barber traces the development of the corky spines in X. alatum, which appears to have a basal cork formation. This he finds to be true of the other plants in the Malvaceæ, Rutaceæ, Simarubeæ, Rhamnaceæ, Leguminosæ, Rosaceæ, Araliaceæ, Cactaceæ and Euphorbiaceæ.—Phar. Jour. and Trans., 1892, 108; Am. Jour. Pharm., 1892, 525; from Annals of Botany, July, 1892.

Salicaceæ.

Populus Tremula—The Tar Obtained from the Bark of.—N. Farmakowsky in Jour. russ. phys.-chem. Ges., 1892, 423.—Chem. Zeit., 1892, 285.

American Poplars.—Editorial, Gar. and For., 5, 277.

Santalaceæ.

Oil of Sandal Wood.—See Olea.

Sapotaceæ.

Balata.—This is a substance resembling gutta percha in its properties, and obtained from the Mimusops globosa or M. Balata. There is a revival in this industry.—Pharm. Jour. Trans., 1892, 441; from Jour. Soc. Arts, 40, 1020.

Gutta-percha.—A specimen of gutta, 26 ounces, the product of one tree from Dichopsis obovata, contained so large a proportion of gum as to render it very brittle and almost valueless.—Kew Bull., lxix, 215; Pharm. Jour. and Trans., 1892, 264.

Scitamineæ.

Allouya Tubers.—Used as a food like the potato by the natives of Trinidad, and has been identified as the product of Calathea Allouya, Lindl.—Kew Bull., 70, 244; Pharm. Jour. Trans., 1893, 346.

Banana—Analysis of the Cavendish or Fiji Variety (*Musa Cavendishii*).—W. M. Doherty describes it as a very unevenly balanced food, not suited alone for the diet of man, but an excellent and wholesome addition to a diet rich in nitrogenous substances. In nutritive properties it bears a close resemblance to potato.—Chem. News, 66, 187.

Cardamon Powder—Adulteration of.—P. Soltstein obtained from three commercial powders an extraordinary amount of ash, from 12.4 to 14.27 per cent. Pure cardamon powder gives but 8.36 per cent. These powders were adulterated with 5 per cent. of sodium carbonate.—Pharm. Ztg., 1892, 373; Phar. Centralh., 1892, 414.

Ginger—Microscopical Examination of Powdered.—W. Ilhardt obtained the following results: Twelve samples were examined, of which four were from grocery stores, the remaining eight from drug stores. Seven were found to be pure; one showed no adulteration, but compared with the other samples a deficiency in starch grains, which might be accounted for by supposing the drug, from which this powder was obtained, to have been worm-eaten. Four samples were found to be adulterated—turmeric, capsicum and mineral matter being recognized as adulterants.

The microscope is the only means by which adulteration may be detected in ginger. The percentage of oleoresin varies so much, that a quantitative estimation is of little value.—Meyer Bros.' Drug., 1892, 297.

Scrophularineæ.

Digitalis purpurea—Constituents of the Leaves of.—A. Urbanczyk.—Inaug.-Dissert.

Digitalis—Drying of.—According to O. Falkenberg, Pharm. Ztg., digitalis leaves, to preserve their medicinal properties in the highest possible degree, should be dried in tin-lined boxes over unslaked lime.—Meyer Bros.' Drug., 1893, 82.

——— *Dose of.*—In a paper read before the Académie royale de Médecine de Belgique (Procès-verbal, April, 1892), Dr. Masius shows that in doses generally considered as hypertoxic, digitalis may be taken not only without inconvenience, but that such massive doses will surely and rapidly prevent the dangers arising from cardiac weakness and from a high temperature. Administered in the dose of 4 Gm. in twenty-fours, digitalis acts as a heart tonic, improves its energy, regulates pulsation, and, therefore, combats venous stagnation, œdema, dyspnœa, symptoms resulting from cardiac insufficiency; it reduces the febrile temperature, bringing it back to the normal, and in the absence of fever exerts no effect upon the tem-

perature. The paralytic action on the heart is not to be feared, though such large doses neither arrest pneumonia nor shorten its course, as has been stated to be done by Prof. Petresco. (See Am. Jour. Pharm., July 1892, p. 367.)—Am. Jour. Pharm., 1892, 468.

——— *Hypodermic Injections of—In Treatment of Cardiac Affections.* —In a number of cases of cardiac affection which rebelled against every treatment, and in which digitalis, given by the mouth, was ineffectual, Dr. K. Zienitz (Med. Obozr., 1892, 37, p. 922, through Nouv. Remèdes, 1892, 419) had recourse to hypodermic injections of digitalis. He used an infusion of digitalis (0.3 to 10 Gm.), of which he injected two syringefuls twice a day.—Am. Jour. Pharm., 1892, 608.

Digitalis Leaves have been the subject of an article by Duquesnel (Jour. d. Phar. v. Elsass-Lothr.), who finds that the yield of digitaline (digitaline chloroformique, Codex,) from digitalis leaves, freed from stems and large ribs, is nearly twice as great as that from official leaves. Further, it takes 5 parts of ordinary fresh leaves to yield 1 part when dry, but when deprived of stems and main ribs it takes 7 parts to produce 1 part of the dried material. The following figures are interesting: 1,000 grams of digitalis deprived of stems and ribs at the time of gathering yielded 1.0 Gm. of digitaline; 1,000 grams of the leaves, freed from stems and ribs by rubbing on a sieve after drying, yielded 0.85 Gm. digitaline; 1,000 grams of the stems and ribs yielded 0.51 Gm. digitaline; 1,000 Gms. of the leaves collected in September, after blossoming, yielded traces only of digitaline.—West. Drug., 1892, 463.

Digitalis purpurea.—Constituents of the Leaves. H. Urbanczyk.—Erlang., 1892. F. Junge.

Digitalonic Acid.—Kiliani describes the method of separation.—Ber. d. Chem. Ges., xxv, 2116.

Digitalin.—See Alkaloids.

Simarubeæ.

Picramnia Camboita, Engl.—A crystalline glucoside (picramnin) has been obtained by Peckolt. The physical and chemical properties are described in Chem. Zeit., 1893, 879.

Picrasma eilantoides, Planch, owing to its bitter taste, is called "Nigaki" (bitter-wood); the bark of the wood was found to contain a crystalline body identical with quassin.—Dr. Shimoyamo, with H. Ono, K. Hyrano, and T. Koshima.—Apotheker Ztg., 1892, 439, 440, 458, 459.

Solanaceæ.

Belladonna—Alkaloids of.—See Alkaloids.

Solanaceous Bases.—See Alkaloids.

Capsicum annuum.—An elaborate investigation of this fruit with a view of closer study of the constituent principles, points out the following important results: The *alkaloidal reactions* which point to mere traces are not due to a substance pre-existing, but to some decomposition product formed either by keeping the fruit or during the chemical manipulation; the substance as isolated formed a resinous mass of conine-like odor, and was very easily decomposable by the strong alkalies. In examining the *capsaicin*, attention was also paid to its accompanying substances; ether was found to be the best solvent, as it extracted more than any other solvent and exhausted the fruit in a short time, so that the residue was void of any sharp taste; the ether extract was soluble in other solvents excepting 90 per cent. alcohol; by treating with methyl alcohol the capsaicin was removed from a considerable portion of other constituents; from this solution it was attempted to isolate the capsaicin by evaporation and sublimation at 160° C., but the sublimate consisted of fatty acids carrying along mechanically a little capsaicin. It was possible to separate the fatty acids from capsaicin by precipitation with a methyl alcohol solution of lead acetate; the excess of the lead acetate was removed by addition of ammonium sulphate, and then by diluting with water the capsaicin and coloring matter was precipitated and then taken up in ether. Subsequent attempts to purify this product failed, the red coloring matter being intimately mixed or combined with the capsaicin (which appears to be an amorphous acid from its behavior towards alkalis, alkaline earths and metallic salts). The accompanying substances were identified as uncombined oleic, palmitic and stearic acids, also a red coloring matter which is not positively identical with carotin, but by saponification was proven to be a cholesterin-ester of the fatty acids.—H. Pabst; Archiv. der Pharm., 1892, 108–134: Am. Jour. Pharm., 1892, 370.

Capsicums—Zanzibar.—Phar. Jour. Trans., 1893, 810; from Consular Rep., 1892, 266.

Cayenne Pepper—Soluble.—Chem. and Drug., 1892, 489.

Cayenne pepper	16 ounces, av.
Alcohol, 94 per cent.	16 fluidounces.
Salt.	16 ounces, av.
Annatto, q. s. to properly color.	

Digest the Cayenne pepper in the alcohol at a gentle heat for two days; then put into a percolating apparatus and displace the tincture; add to the tincture one pound of table salt, rub them together in a mortar, and add sufficient annatto to give the mixture the proper color. Evaporate, and finally dry in a stove at about 120° F. When dried, rub through a coarse sieve.

Datura alba, Nees.—The capsules before the introduction of chloroform, were used as an anæsthetic in Japan. The plant contains both

hyoscyamine and atropine, the former being present in much the larger quantity.—Am. Jour. Pharm., 1892, 523.

Datura alba—Bases of.—Shimoyamo and Koshima have ascertained that the seeds of this Japanese plant contain hyoscyamine, together with a small amount of atropine. The plant is distinguished from Datura Stramonium chiefly by the enormous height to which it often grows. Prior to the introduction of chloroform it was used for producing anæsthesia.—Apoth. Zeit., vii., 458.

Daturic Acid.—E. Gérard has studied the salts of this acid, obtained by him from stramonium seed (see Am. Jour. Phar., 1890, p. 493). The normal alkali salts are crystalline, soluble in a small quantity of hot water, precipitated from the solution by table salt, and decomposed by much water with the production of a crystallizable acid salt. The copper and silver salts crystallize from hot alcohol, but are insoluble in water and ether. The lead salt is amorphous and only sparingly soluble in hot alcohol or boiling ether. The acid yields an uncrystallizable bromo-derivative $C_{17}H_{33}BrO_2$. On distilling daturic acid over lime, daturone, $C_{33}H_{66}O$, is obtained, which crystallizes in pearly spangles from hot alcohol, and these melt at 76° C.—Jour. Phar. Chim., 1892, 8; Am. Jour. Pharm., 1892, 366.

Henbane Seeds—Poisoning by.—H. C. Martin.—Brit. Med. Jour.; Bull. Pharm., 1892, 334.

Lycopersicum esculentum.—F. Davis. A qualitative analysis of the tomato.—(Brit. Pharm. Conference), Pharm. Jour. Trans., 1892, 254.

Potato Diseases.—A peculiar form in the Bengal Presidency.—Kew Bull., 70, 238; Phar. Jour. Trans., 1893, 346.

Scopolia Atropoides.—Photograph in Chem. and Drug., 1892, 912.

Scopolamine.—See Alkaloids.

The Horse Nettle (Solanum Carolinense).—J. L. Napier has made a concentrated tincture of this plant by macerating the crushed berries in an equal part of whiskey. It is used in convulsions during pregnancy, in teaspoonful doses every three hours. It is claimed also to benefit cases of epilepsy.—Am. Therap., 1892, 127.

Solanum paniculatum (Jurubeba).—D. Freire obtained an alkaloid jurubebine, and two resinoid principles, jupébebine and jupebin.—Chem. and Drug., 1893, 737.

Chemistry of Tobacco.—R. Kissling, in Chem. Zeit., 1892, 1153.

Tobacco Plant—Chemistry of.—R. J. Davidson.—Virg. Sta. Bull., No. 14, 1892.

Tobacco—Analysis of Commercial.—V. Vedrodi.—Zeitschr. f. Anal. Chem., 1893, 277–296.

Tobacco Juice – Analysis of—By Arm. Gautier. The author has found

tobacco juice to contain chiefly bases, and next to much nicotin a homologue of nicotin, $C_{11}H_{16}N_2$, a lutidin, C_7H_9N, a dihydropicolin, C_6H_9N, a base C_6H_9NO and other heavier volatile bases.—Ber. d. Chem. Ges., xxvi, Ref. 1, 24, 1893.

Tobacco Smoke.—A. Gautier.—Compt. rend., cxv, 992.

Nicotine.—See Alkaloids.

Sterculiaceæ.

Cacao-beans—Theobromine Estimation in.—The beans with an equal weight of purified sand are finely comminuted and then six Gms. of the mixture extracted with petroleum ether in a continuous extraction apparatus for ten hours, to remove the fat; the residue is boiled for one-half hour with 200 C.c. distilled water and 6 Gm. freshly prepared pure lead hydrate, strained, expressed and filtered; the insoluble portion is twice boiled with 100 C.c. distilled water and the united filtrates evaporated to 10 C.c., transferred to a separating funnel and agitated for three minutes with 100 C.c. chloroform. After complete separation of the chloroform, requiring about three hours, the chloroform is removed and the operation repeated three times. From the combined chloroform solutions the greater portion of the solvent is distilled off, the remaining solution transferred to a tared beaker, the flask rinsed with warm chloroform and the contents of the beaker evaporated to dryness in a water-bath. The theobromine is obtained in the form of almost perfectly white, microcrystalline powder which, by ignition upon platinum foil, leaves only traces of ash.—P. Süss (Ztschr. f. anal. Chem.), Apotheker Ztg., 1893, 78; Am. Jour. Pharm., 1893, 170.

Cacao Beans.—Chemical and pharmacognostical investigation upon 23 specimens. Beckurts and Hartwick.—Arch. der Pharm., 1893, 589.

——— *Chemical Characteristics of the Constituents of.*—A. Hilger has isolated from cacao bean a glucoside which, under similar conditions, yields theobromine, cacao-red, and dextrose. The glucoside is obtained as follows: After removing all fat by means of benzin, and extracting the theobromine and dextrose with cold water, the cacao-bean powder is treated with alcohol. On evaporating the latter, the peculiar glucoside remains as a residue, which is purified by repeatedly dissolving in dilute solution of potassium hydrate, and precipitating with dilute hydrochloric acid.—Apoth. Zeit., 1892, 469; Pharm. Centralh., 1892, 585.

Cacao Butter.—The record of Mr. T. Maltby Clague's investigation into the melting point of cacao butter affords a remarkable instance of the manner in which variation in the behavior of different samples of a similar substance may often be explained by purely physical causes. Indeed, his experiments go far to prove that this substance may have its characteristics considerably influenced, and even permanently altered, by a temporary

subjection to changes in its surroundings. In ten commercial samples of cacao butter he found the melting point varied from 73° to 91° F. The B. P. range is from 86° to 95°. A sample expressed by Mr. Clague from the nibs, with the aid of heat, melted at 91°; another, obtained by percolation with ether, at 83°; whilst a third, extracted in the same way from a prepared cocoa, had a melting point at 96°. Certain of the commercial specimens were further treated by being heated consecutively to 105°, 120°, 150°, and 180° F. The melting point in each case altered considerably under this treatment, for, being ascertained after each step, it was found to rise until it reached an apparent maximum, after which any further increase of temperature lowered it again. Maintaining an increased temperature for a length of time was also found to exert a distinct influence, a sample with a melting point of 75° F. having this raised to 86°, after being kept at a temperature just under 100° for two hours. It appears evident that such variability in the commercial product is the result of the application of heat in greater or less degree during the process of extraction, for a specimen prepared by percolation with ether from its unroasted nibs possessed a practically constant melting point of 86° F. Mr. Clague inclines to the opinion that a complete solution of the difficulty will only be obtained after a chemical investigation, and meanwhile he warns dispensers to exercise care in the selection of cacao butter suitable as a basis in suppository making.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 247.

Cacao Butter—A. H. Allen gives a Resumé of Tests for.—Drug. Circ., 1893, 58.

Cocoas—Complete Analysis of 5 Commercial Cocoas.—J. S. Liversidge.—Chem. and Drug., 1893, 618.

Cacao—The Preparation of.—E. Fowler.—Pharm. Era, 1892, 71.

——— *Preparation of.*—A. Stutzer, in Pharm. Centralh., 1892, 479.

——— *Correction regarding the Preparation of.*—A firm of German chocolate makers' reply to A. Stutzer's remarks upon the preparation of cacao.—Pharm. Centralh., 1892, 440.

——— *Van Houten's*—Litigation.—Abstract in Chem. and Drug., 1893, 562, 612, 655.

Cocoa Preparations—Estimation of Sugar in.—M. Schroeder, in Zeitschr. f. Angew. Chem., 1892, 173.

Theobroma Cacao.—Amer. Drug. and Pharm. Record, 1893, 360.

Cacao in Ecuador—Report by Consul-General Sorsby.—Nat. Drug., 1892, 199.

Cocoa—Trinidad—Statistics.—Pharm. Era, 1892, 137.

Helicteres Isora.—Schimmel and Co.—Pharm. Post, 1893, 208.

Kola-Nut and Cacao-Nut Constituents.—The investigations of Dr. E.

Knebel (Am. Journ. Pharm., 1892, 190), disclosing the fact that the kola-nut contained a glucoside which by decomposition gave rise to caffeine, glucose and kola-red, and rendering it very probable that fresh kola-nuts contained no caffeine, but only glucoside, has been verified by A. Hilgby, who recently obtained fresh kola-nuts so as to perform the necessary analysis. Of other drugs yielding caffeine and theobromine, a specimen of cacao-nut preserved in alcohol was examined, with results similar to those obtained from the kola-nut. There is present a glucoside which is decomposable by a diastatic ferment, also present in the fruit, into dextrose, cacao-red and a mixture of caffeine and theobromine; boiling water and warm dilute acids also bring about decomposition. The fresh fruit was found to be free from cacao-red, caffeine and theobromine. To isolate the glucoside from the commercial cacao-nut, the fat is removed by use of petroleum ether, the theobromine and dextrose by use of cold water, and then the glucoside extracted with alcohol; the solvent is carefully evaporated, leaving the glucoside, which is purified by repeated dissolving in very dilute potassium hydrate solution and precipitation with dilute hydrochloric acid.—Apotheker Ztg., 1892, 469; Am. Jour. Pharm., 1892, 568.

The Kola Nut.—L. Paparelli.—Pharm. Era, 1892, 70.

Kola Constituents.—Analysis by Astier.

	Per Cent.	
Caffeine	2.348	Matter soluble in chloroform. 2.983 per cent.
Theobromine	0.023	
Tannin	0.027	
Fatty substances	0.585	
Tannin	1.591	Matter soluble in alcohol, 5.826 per cent.
Kola-red	1.290	
Glucose	2.874	
Non-volatile salts	0.070	
Starch	33.755	
Gum	3.040	
Coloring-matter	2.561	
Proteids	6.761	
Cellulose	29.831	
Water	11.919	
Ash	3.325	
Total	100.000	

—Chem. and Drug., 1893, 7[illegible].

Kola Red.—E. Heckel. An abstract of an article on the chemical constitution and physiological action.—Chem. and Drug., 1893, 127, and Pharm. Post, 1892, 7.

Kola Nut—Physiological Action of.—After considering all the arguments and weighing the evidence produced in favor of each, Combemale (Bulletin gen. Therap., Feb., 1892), arrives at the conclusion that Professor

See's view is the correct one, that the action of kola in counteracting the sensation of fatigue depends solely upon the caffeine, of which kola contains two or three times the proportion of that met with in coffee; and that this also explains the success of kola in the treatment of diseases of the heart and in the renovation of strength during convalescence or following intellectual or physical over-exertion. The favorable effects of kola in diarrhœa are due to the tannin present in the drug.—(See also Amer. Jour. Phar., 1892. pp, 79, 191, 230); Am. Jour. Pharm., 1892, 367.

Sterculia scaphigera.—Analysis and description, with illustration of the fruit.—Chem. and Drug., 1892, 159, 417.

Styraceæ.

Siam Benzoin.—F. Ludy.—Arch. der Pharm., 1893, 461–480.

Sumatra Benzoin.—Professor Tschirch, during a visit to a benzoin tree plantation in Java, made the interesting observation that the trees contained neither secretion nor secretion-cells; in fact, that all parts of the tree were perfectly odorless and that only after wounding the tree did the balsam commence to exude. It follows, therefore, that the tree must contain some constituent which, under the conditions alluded to, gives rise to benzoin balsam. An examination, having for its object the isolation of this constituent, was made possible, as Professor Tschirch brought with him some bark from young trees, Styrax Benzoin, Dryand. To aid this examination, authentic Sumatra benzoin was first investigated. Contrary to the published statements it was found that benzoin was entirely, although somewhat slowly, soluble in ether. By agitating this solution with 4 per cent. solution of soda until neutral reaction resulted, separating the ethereal layer and carefully evaporating it, an oily residue was obtained, in which traces of styrol, benzol and benzaldehyde, 2–3 per cent. styracin and about 1 per cent. phenylpropyl cinnamate were found. From the sodium hydrate solution, vanillin, benzoic and cinnamic acids and the three resins were isolated. γ-resin soluble in sodium carbonate solution, the part insoluble, treated with ether, was again separated, α-resin dissolving while β-resin remained insoluble. Prolonged boiling of α-and β-resins with sodium carbonate solution caused them to change into γ-resin; this again by boiling with potassium hydrate solution was decomposed, cinnamic acid and two alcohols resulting; white crystallizable benzoresinol, $C_{16}H_{26}O_4$ (present in small quantity only), and amorphous brown resinotannol, $C_{18}H_{20}O_4$. The three resins of previous investigators, making up the larger part of benzoin, therefore are mixtures of the more or less decomposed esters of cinnamic acid with these two alcohols. Besides free benzoic acid there is also present a quantity of free cinnamic acid. The bark of the uninjured trees by analysis contained traces of wax, small quantities of phloroglucin and sugar, and large quantities of a tannin easily oxidixed to a phlobaphen (benzophlobaphen) having the formula $C_{51}H_{50}O_{21}$. As the uninjured bark

contains neither secretion nor excretion-cells, but does contain large quantities of tannin, and as the balsam contains a large quantity of resinotannol (an alcohol reacting like a tannin) and the balsam formation first takes place in the parts of the bark containing the tannin, it is very probable that benzoin balsam is produced from the tannin of the bark.—Fritz Lüdy, Arch. der. Pharm., 1893, 43–95.

Sumatra Benzoin.—Prof. E. Schmidt, supplemental to the previous article, gives some results of an elaborate examination made by C. Denner some years ago, but of which no complete statement ever appeared in print. He isolated free benzoic and cinnamic acids, styrol, vanillin, benzaldehyde, styracin, benzyl cinnamate, and three so called benzoresins; the styrol and benzaldehyde were obtained in much larger quantity than by Lüdy, so that they could be identified by a number of chemical and physical tests.—Arch. der. Pharm., 1893, 95–98; Am. Jour. Pharm., 1893, 223, 224.

Ternstromiaceæ.

Teas—Preparation of.—Y. Kosai finds that the tea shrubs excluded from the light three weeks before picking contain 4.532 per cent. of theine, while those grown in the light contain but 3.784 per cent.—Abstract, Jour. Chem. Soc., 1892, 1371.

Tea Museum in Russia.—Announcement of this museum at Moscow.—Chem. and Drug., 1892, 258.

Cultivation and Production of Tea in Ceylon, Java and China.—W. A. Tichomirow.—Pharm. Zeitschr. f. Russ., 1892, 353, 369, 385, 401.

Tea and Coffee—Tannin of Tea Plant and Fat of Coffee Seeds.—F. Tretzel.—Inaug. Dissert., Erlangen.

Tea, Flavoring of.—Java teas, which are of no value for exportation, are being improved in flavor by the flowers of *Jasminum Sambac, Aiton, Aglaia odorata, Lour.*, and *Gardenia pictorum, Hassk.* According to *Rev. internat. des Falsif.*, an industry has been started at Cheribon, Java, to prepare such teas in imitation of Chinese tea.—Am. Jour. Phar., 1892, 468.

Lao Tea.—Leaves of Camellia theifera prepared by the natives of Siam for chewing.—(Kew Bull.) Pharm. Jour. Trans., 1892, 346.

Extracted Tea—Detection of.—W. A. Tichomirow. If dry extracted tea is covered with a cold saturated solution of copper acetate, the blue color of the liquid remains unchanged for months. With dry fresh tea (not extracted) the original blue color of the liquid is found on the second day to have been changed into a greenish blue, and subsequently to a pure green. The leaflets of the fresh (not extracted) tea remain strongly contracted and rolled up even after steeping in the water for weeks, whilst tea which has been previously extracted unrolls perfectly without any previous immersion in water.

The characteristic distinction between extracted and fresh tea is shown by the idioblasts. If miscroscopic sections of leaves which have been steeped for from 1 to 4 days in a cold saturated solution of copper acetate are touched with a drop of the "liquor ferri acetici" of the Russian Pharmacopœia (specific gravity 1.134 to 1.138), and examined under the microscope, all the histological elements which contain tannin have taken a deep, black blue color. The tannins are fixed in their normal places by the previous treatment with copper acetate.

In leaves which have been previously extracted, the cell-walls have been previously permeated by the tannin dissolved in water, whilst in fresh tea they remain colorless, because the tannins are found normally not in the idioblasts, but in the surrounding parenchyma cells. The shrivelling and the inability to unroll in water the tea-leaves which have not been previously extracted with hot water must depend on the formation of a dense, solid copper tannate, insoluble in water. It is a kind of tannin which prevents the turgescence of the tissues.

E. Hanausek (Zeit. f. Nahrungsmittel-Untersuchung) detected the appearance of a green color also in extracted tea, and in his experiments the idioblasts did not show sharply and consistently the expected microchemical reactions, probably in consequence of the complete exhaustion of the leaves. Hanausek's further experiments had the purpose of determining the refractive index of the infusion of tea as a distinction between extracted and recent tea.

As these experiments are not completed, and as the determination of the proportion of extract affords a more certain basis than the indices of refraction, which do not differ very widely among themselves, we must refer to the original.—Pharm. Zeit. f. Russland; Chem. News, April 28, 1893.

Caffeine.—See Alkaloids.

Tiliaceæ.

Corchoris fasciculatus, Linn.—R. P. Banerjee found it therapeutically useful in bronchitis, gonorrhœa and as a diuretic. It grows as a weed in most parts of Rajputana.—Indian Med. Rec.; Bull. Pharm., 1892, 515.

Turneraceæ.

Damiana.—Analysis of the tea and two commercial fluid extracts by A. Gawalowski.—Pharm. Post, 1893, 257.

Umbelliferæ.

Aniseed—Adulterated.—According to Brit. and Col. Drug. a sample of aniseed recently examined by an analyst in Holland has been found to consist of two and one-half per cent. of seeds of *Conium maculatum*, fifty-five per cent. of fennel seed, and ten and one-half per cent. of the seeds of a grass (*Panicum*).

Ammoniac, Galbanum and Myrrh.—Researches upon, by M. Frischmuth.—Dorpat, Mattiesen, 66 p.

Asafœtida has been successfully administered in Italy in threatened abortion (Centralb. f. Gynak., 1892, No. 9). Dr. Turazza followed Negri's treatment, giving in the beginning of pregnancy asafetida 0.1 Gm. twice daily, gradually increasing the dose to ten pills, and then slowly reducing it till confinement.—Am. Jour. Pharm., 1893, 139.

Cicuta maculata, L.—A. S. Blackman. The author collected a quantity of the roots of this plant in July and allowed them to dry, submitting the drug about three months afterwards to a proximate analysis, with the following results:

Solvents used.	Substance obtained.	Per cent.	
Petroleum ether	Volatile oil	.068	
	Fat	.640	
	Wax	.376	
			.984
Stronger ether	Brown resin		1.380
Absolute alcohol	Resin		1.996
Distilled water	Mucilage	1.000	
	Dextrin	1.500	
	Glucose	3.555	
	Extractive	2.445	
			8.500
Dilute solution of sodium hydrate	Pectin	1.500	
	Extractive	1.000	
			2.500
Dilute hydrochloric acid	Pararabin		2.900
Boiling distilled water	Starch	5.500	
	Extractive	2.500	
			8.000
Chlorine water	Lignin		2.396
Nitric acid and potassium chlorate	Incrusting matter		10.264
	Cellulose		31.436
	Ash		11.608
	Moisture		9.127
	Loss		8.969
	Total		100.00

He obtained negative results for alkaloids or glucosides, but the root collected in November, gave indications of an alkaloid.—Am. Jour. Phar., 1893, 4.

Cicuta virosa.—Examination of by F. Lüdtke.—Arch. der Pharm., 1893, 34.

——— Ethereal Oil of the Seeds.—J. Trapp.—Ibid., 212.

Daucus Carota—Notes on.—C. W. Hargitt.—Bot. Gaz., 17, 328.

Parsley.—Dr. Mourgues (Soc. chim. de Paris, June 24, 1892,) isolated from parsley a higher homologue of apiol, which he named cariol $C_{11}H_{12}O_4$. It polymerizes easily, and yields a penta-bromcariol $C_{11}H_{13}Br_5O_4$. The

physiological action of cariol is similar to that of apiol, but weaker.—Am. Jour. Pharm., 1892, 516.

Urticaceæ.

Anagallis arvensis—Digestive Ferment in.—See Ferments.

Cannabis indica and its Smokers.—From a paper by Julius Stinde.—Nat. Drug., 1893, 214.

Ficus rubiginosa and F. macrophylla—Resins of.—Rennie and Goyder. Preliminary notice.—Jour. Chem. Soc., 1892, 916.

Henequin Hemp, Production of, in Yucatan.—Rocky ground is most favorable for this plant, and the only preparation made for sowing the hemp is to clear the ground of trees and plants. The first crop sown on the ground so cleared is maize, this being the quickest crop; this gives time for farmers to rail in their land until hemp is ready to take the place of corn. On most farms the ground is cleaned twice a year. There is no fixed time for cutting the leaves. The usual custom is to take from each plant, commencing from below, some few leaves in the first year of production, and afterwards some 24 leaves from each plant. Too much cutting kills the plant very soon. On the other hand, plants cannot be left without cutting the leaves when ripe, as by cutting the plant continues producing. The export of Yucatan hemp for 1892 was nearly 350,000 bales. —Pharm. Jour. and Trans, 1892, 27; from Consular Report, No. 236.

Hops—Constituents of.—Briant and Meacham point out that hops owe their preservative power, according to Haydruck, to three resins which are bitter. Several tannins are believed to be present.—Trans. Inst. Brew., vi, 149; Pharm. Jour. Trans., 1893, 988.

Extraction of Hops.—Influence of the Strength of Alcohol.—Strassman and Levy.—Chem. Zeit., 1892, 1123.

Stachys tuberifera.—The tubes are used as a food, and contain large quantities of a crystallizable carbohydrate, *stachyose*, and small quantities of glutamine and tyrosine. Besides these substances two nitrogenous bases have been discovered in the precipitate with auric chloride, the light colored portion being converted into the platinochloride, and this crystallized from water; two salts were present, one yellow, granular and difficultly soluble in water in small quantity, the other large, orange red, and very soluble in water; the latter is the *stachydrine* platinochloride, which for further purification, was converted into the double mercuric chloride salt, and this into stachydrine hydrochlorate, 100 kilos of the fresh tubers (containing about 20 per cent. dry substance) gave 10–12 Gm. of the hydrochlorate. The alkaloid crystallizes from water (forming a *neutral* solution) and alcohol in colorless, transparent, deliquescent crystals; dried at 100° it melted at 210° C., and had the formula $C_7H_{13}NO_2$; the hydrochlorate dried at 100° ($C_7H_{13}NO_2HCl$) forms large prisms, very soluble, but not deliquescent, in water and alcohol. It gives towards reagents

the same reactions as *betaine*, but differs from it in the fact that the betaine hydrochlorate is insoluble in alcohol.—A. v. Planta and E. Schulze, Arch. der Pharm., 1893, 305.

Valerianaceæ.

Valeriana officinalis var. angustifolia, Miq.—The root yielded 2.7 per cent. volatile oil (more than the European variety) of sp. gr. 0.805 at 17° (lævogyre in 5 Cm. tube—55.5°); valerianic acid was identified as one of the constituents.—Am. Jour. Pharm., 1892, 523.

Valerian—Japanese.—Shimoyamo and Hyrano find that the roots of the indigenous valerian, which differs somewhat from Valeriana officinalis, yield 2.7 per cent. of volatile oil, having a specific gravity of 0.805 at 17°. They obtained valeric acid that was dextro-rotatory.—Apoth. Zeit., vii., 440. (This is identical with the above.)

Verbenaceæ.

Verbena urticæfolia.—Robert M. McFarland examined the root of this plant collected by himself near Henderson, Kentucky, during the summer of 1891. He found the alcoholic extract to contain a crystalline bitter principle, the character of which was not fully determined, but appears to be an acid. The aqueous solution when agitated with chloroform yielded a glucoside with a bitterish and slightly nauseous taste. He also found 0.91 per cent. of a substance consisting of a volatile oil, fat and caoutchouc; resin 0.55 per cent., mucilage 2.40 per cent., dextrin 5.28 per cent., glucose 5.32 per cent., saccharose 4.84 per cent., pectin and albuminoids 3.84 per cent., starch 1.76 per cent. The cellulose, lignin, and incrusting matter amounted to 40.51 per cent. Ash 13.82 per cent., moisture 10.82 per cent.—Am. Jour. Pharm., 1892, 401.

Rauwolfia serpentina, Benth.—A preliminary note on certain reactions of an alkaloid contained in the roots. By C. J. H. Warden and Chuni Lal Bose. Many of the reactions, described by them as being afforded by the alkaloid, which they have provisionally termed pseudobrucine, were identical with those yielded by brucine, while certain reactions were quite different. When they are satisfied that they have obtained the alkaloid in a pure state, its ultimate composition, etc., will be determined.—Phar. Jour. and Trans., 1892, 101, 102.

Vitaceæ.

Defoliation of the Vine.—A. Muntz finds that in dry seasons defoliation is detrimental to the vine by removing the store of food material which is available for the grapes during the period of ripening. In wet seasons he was unable to discover any beneficial results. He also states that the direct action of the rays of the sun is not favorable to the production of sugar in the grape.—Compt. rend., 114, 434; Phar. Jour. Trans, 1893, 48.

Xyridaceæ.

Xyridaceæ of Brazil.—T. Peckolt contributes to the Materia Medica of Xyris laxifolia, Mart.; X. pallida, Mart.; Albolba brasiliensis, Kunth; A. poarchon, Seub.—Pharm. Rund., 1892, 164.

MATERIA MEDICA (ANIMAL).

Ambergris.—G. Pouchet (Rép. de Phar., August, 1892) observed that different samples of ambergris, though differing in appearance, have a close resemblance in odor and composition. The drug consists of acicular crystals with a considerable proportion of blackish pigment and a certain quantity of excremental matters characterized by the presence of beaks of cephalopodes.

The microscopical and chemical examination of this product has led S. Jourdain (Jour. de Phar. et de Chim., Aug. 25, 1892) to regard it as analogous to intestinal calculi; but what particularly attracted his attention was the presence of a large number of the jaws of cephalopodes, either entire or in fragments. Some of these animals exhale a strong odor, which does not disappear after death or on drying. This peculiar perfume, modified by the biliary products of the sperm whale, constitutes the odor of ambergris. The black coloring matter of the latter is likewise due to cephalopodes, which contain it in considerable quantities.—Am. Jour. Pharm., 1892, 570.

Ambergris.—H. Beauregard is of the opinion that ambergris may be considered as an amber-colored calculus containing some excrementitious matters and a proportion of black pigment.—Jour. de Pharm. D'Anvers., 26, 346; Phar. Jour. Trans., 1893, 346.

Ant Oil.—C. Schall.—Ber. d. Chem. Ges., xxv, 1489.

Cancroin is obtained by Adam Kiewicz from cancer tissue, upon which Coccidium sarkolytus is parasitic. Cancroin is a functional product, and as such presents protection against the parasite itself. It has a remarkable similarity, physically and physiologically, to the ptomaines, especially to neurine, and the latter could replace cancroin in its specific action towards the cancer-cell; it is possible that the two substances are identical. This name cancroin is not only given to the poison in the cancerous tissue, but also to a solution containing 25 per cent. neurine neutralized with citric acid, then saturated with carbolic acid, and, lastly, diluted with twice its volume of water.—Pharm. Ztg., 1892, 755.

——— Compare Karsten, in Zeits. Oest. Apoth. Ver., 1893, 411, on disease due to the assimilation products of organized bodies.

Cantharidin—Preparation of.—E. Dieterich (Helf. Annal., 1892, 1; Jour. Pharm. Chim., 1893, 375) proceeds as follows: (1) Macerate the powdered cantharides in acetic ether with a little sulphuric acid; (2) neutralize excess of acid with barium carbonate; (3) exhaust with acetic ether, and then distil the solution; (4) evaporate the residue to dryness, and treat it with petroleum ether to extract fatty acids; (5) extract the resinous coloring matter with alcohol, and finally purify by repeated crystallization. The sulphuric acid is to set free the cantharidin which exists in a combined state, and which is not dissolved until it becomes free. The quantities used are as follows:

Cantharides (coarsely powdered)	1000 parts.
Sulphuric acid (1.838)	20 parts.
Acetic ether (.902)	1500 parts.
Barium carbonate	40 parts.

The cantharidin so obtained is almost white, and quite pure enough for preparing plasters. To purify it finally, it is best to digest a solution of the crude cantharidin in acetic ether with animal charcoal for two hours at 50° C. Filter off and crystallize.

——— Debuehy (Jour. de Pharm. et de Chim., 1892, 24, 13) advises the use of methyl-formic ether in place of acetic ether, chloroform, etc., for extracting the cantharides, and petroleum ether for washing the impure cantharidin in place of carbon bisulphide.

——— Preparation of cantharidin hydrazon by F. Anderlini.—Gazz. Chim., 1893, 121; Chem. Zeit. (Rep.), 1893, 99.

——— *Action of Diamine upon.*—Ibid.

——— *Action of Phenylhydrazine on.*—L. Spiegel proposes the name cantharidinphenylhydrazone hydrate ($C_{16}H_{20}N_2O_4$).—Ber. d. chem. Ges., xxv, 2956; xxvi, 140.

Potassium Cantharidinate.—Summing up of conclusions arrived at by F. Coccia in his trial of Liebreich's treatment of tuberculosis.—Squibb's Ephem., Feb., 1893.

Cocaine-cantharidate.—A mixture of cocaine and cantharidin for tuberculosis. It is a white, odorless powder, slightly soluble in warm water, insoluble in alcohol, ether and benzene. It is used with chloroform water (0.075–0.15 Gm.; 50.0 Gm.) for hypodermic injections.—Berl. klin. Wochenschr., 1892, No. 35; Pharm. Centralh., 1892, 616.

Cantharidin.—Death by 26 centigr. cantharidin.—Pharm. Post, 1892, 685.

Cantharidin.—The action and danger in the use of vesicatory agents.—J. V. Laborde. Tribune méd., Paris, 1892, 2 s., xxv, 309, 324.

Cantharidin and Cantharidal Cerate.—The manufacture of cantharidin by the following improved process has given good results during the past

eleven years; by it the free and combined cantharidin is extracted: 1000.0 parts moderately-fine powdered cantharides are macerated in the cold for two days with a mixture of 20.0 parts of sulphuric acid (sp. gr. 1.838) and 1500.0 of acetic ether (sp. gr. 0.902); after adding 40.0 parts barium carbonate the mixture is exhausted with acetic ether in an extraction apparatus. The solvent is distilled off, and the residue, consisting of resin, fat and cantharidin, is allowed to stand eight days to induce crystallization of the cantharidin; 200.0 parts petroleum-ether (sp. gr. 0.740) are then added, and gentle heat is applied to facilitate solution of the fat; the solution is filtered off, the cantharidin washed with petroleum-ether, and re-crystallized from 90 per cent. alcohol. The product is almost white and sufficiently pure for the manufacture of plasters, etc.; should the cantharidin be needed purer for other purposes, it must be re-crystallized from acetic ether with the addition of animal charcoal. The following yields have been obtained: Lytta vesicatoria, 0.3–0.45 per cent.; Epicauta Gorrhami (a Japanese beetle), 0.45 per cent.; Mylabris Cichorii, 0.9–1.3 per cent.

The several Pharmacopœias in their formulas for making the cantharidal cerate extract only the free cantharidin; in the following process it is aimed to extract the total cantharidin; 100.0 parts olive oil and 525.0 parts of yellow wax are melted, and a mixture of 1.0 parts of sulphuric acid (sp. gr. 1.838) and 10.0 of alcohol (90 per cent.) uniformly mixed in; after adding 250.0 finely-powdered cantharides, the mass is allowed to stand for two hours at 60–70° C., stirring frequently; finally, an intimate mixture 2.0 of barium carbonate and 6.0 alcohol (90 per cent.) is incorporated. The process has suggested the question, "Would it not be better to add the acid mixture to the cantharides and later to add the oil and wax?"—Pharm. Centralh., 1892, 425.

Cochineal Industry in Guatemala.—Pharm. Era, 1893, 227.

Carmine.—Tests for detection of adulterants.—Pharm. Post, 1893, 47; Zeits. Oest. Apoth.-Ver., 1892, 824.

Eggs—Process for Preserving.—A German patent gives the following process of keeping eggs fresh: "Puncture the shell with a very fine-pointed syringe, and inject a saturated solution of sodium chloride until the air chamber of the egg is filled. Close the opening with a drop of paraffin, wax, sodium silicate, or any other convenient medium. Eggs thus treated will preserve their freshness for years." They might answer for cooking, but would scarcely serve as "fresh eggs" for pharmaceutical or similar purposes.—Nat. Drug., 1893, 209.

Yolk of Eggs.—Examination of commercial specimens by M. F. Jean.—Monit. Scient., 1892, 561; Chem. Zeit., 1892, (Chem. Rep.,) 264.

The author examined fresh and salted yolk of egg, and determined the water, dry extract, vitellin, extractives soluble in water, and ash. The water is determined by adding a few drops of acetic acid to 10 Gm.

of the sample, drying first at 50 to 60° C., and then at 110° C., until the weight is constant. In order to determine the fat and the vitellin, the dried residue is extracted with petroleum ether in a Soxhlet apparatus, the ether evaporated to dryness, and the residue dried at 110° to 115° C., and extracted with water. This aqueous extract is evaporated on the water-bath, and afterwards heated to 110° C. The residue thus left consists of water-soluble extractives, which are taken as soluble vitellin. The residue insoluble in water is the fat. The ash is determined by incinerating 10 Gm. of the sample in a platinum dish (at first at a low temperature) until the residue is white. When the water, fat, ash, and water-soluble extractives are known, the difference is put down as insoluble vitellin, and this added to the soluble vitellin, already estimated, gives the total vitellin. The salts found in the ash are sodium chloride, sulphate, borate, and nitrate. Of these it generally suffices to determine the first, which is best done on the aqueous extract of a fresh quantity of the yolk of egg, dried at 100° C., rather than on the total ash. An average sample of fresh yolk of egg, analyzed in the manner given above, contained water, 52.6; ash, 1.4; fat, 28, and vitellin, 18 parts per cent. respectively.

Frog's Eye—A Constituent from, Possessing Anæsthetic Properties.—A substance in effect like cocaine, and used by the Chinese from time immemorial.—Nat. Drug., 1892, 81.

Gelatin—Solvents for.—R. E. Liesegang.—Phot. Arch., xxxiii, 212; Pharm. Jour. Trans., 1893, 990.

Honey from Aphides.—H. W. Wiley.—Jour. Am. Chem. Soc., 1893, 350.

Honey.—Analyses of 78 specimens by G. Mapwigo.—Zeitschr. Nahr.-Unters. u. Hygiene, 1892, 317; Chem. Zeit., 1892, 1344.

——— *Adulterated.*—Names of adulterators.—Drug. Circ., 1893, 79.

——— *Statistics.*—The hives are estimated: Greece, 30,000; Denmark, 90,000; Russia, 110,000; Belgium, 200,000; Netherland, 240,000; France, 950,000; Germany, 1,450,000; Austria, 1,558,000. In the United States, 2,800,000 hives produce sixty-one million pounds of honey.—Brit. and Col. Drug., 1892.

——— *Containing Iron.*—L. Carcano, in Boll. Chim.-Farm; Pharm. Post, 1893, 104.

Lard—Analysis of.—Amthor and Zink recommend the use of the solution as originally prescribed by Von Hübl.—Zeitschr. f. anal. Chem., 1892, 534.

Examination of adulterations of.—M. Mansfeld.—Zeits. Oest. Apoth. Ver., 1893, 105.

Vegetable Oils in Lard—Detection of.—Welmans. The reaction depends on the presence of alkaloids in the vegetable oils. To 1 Gm., or 25 drops

of the lard are added 5 drops of chloroform and 2 C.c. of phosphomolybdic acid solution, together with a few drops of nitric acid, the mixture being well shaken. The presence of alkaloids or glucosides causes reduction, accompanied by a green coloration. Purified oils do not react in this way.

Picric acid in ethereal solution, when shaken with 10 C.c. of the oil, gives a brown coloration, after allowing the ether to separate.—Pharm. Zeit., xxxvi, 798.

Cotton Seed Oil in Lard.—See Cotton Seed Oil.

Pure from Adulterated Lard—Taylor's Scheme for Differentiating.—The author gives the following:

1. Heat, over the flame of a Bunsen burner, in a porcelain capsule, four ounces of pure, home-rendered leaf lard for a period of one minute, and allow it to cool slowly until it solidifies, which will require a period of about four hours in an atmosphere of about 75° F. The crystalline groupings of this sample will appear very small when viewed under a power of 100 diameters. 2. Prepare, in like manner, another sample of pure leaf lard, heating it for a period of four minutes, and allowing it to cool slowly, as above. It will be observed that pure lard in this case shows well-defined crystals of stearin, viewed under the microscope as above, and will, without regard to the high temperatures to which it has been exposed, consolidate in about the same time as that given in the first experiment. 3. Prepare a sample of compound lard, consisting of commercial stearin and sufficient cotton-seed oil to bring the stearin to the consistency of good, pure lard; heat four minutes, and allow this mixture to cool slowly, as above. It will consolidate in about an hour at 75° F. 4. Prepare a second sample of compound lard, consisting principally of commercial stearin, to which a trace of pure lard has been added; heat this compound for a period of four minutes. This compound will also consolidate quickly, owing to the presence of stearin in large quantity. 5. Prepare a third sample of compound lard, consisting of commercial stearin, oleo, and cotton-seed oil, with a trace of pure lard; heat four minutes, and allow it to cool slowly at 75° F. In this case it will be observed that the time required for consolidation will depend upon the amount of stearin present. 6. Prepare a sample of commercial oleo after the method of the first experiment. This, like pure lard, will require about four hours at 75° F. to consolidate. 7. Prepare a sample of commercial stearin, heating it four minutes. This will consolidate in about half an hour or less, at the temperature given above.—Nat. Drug., 1892, 103.

Adeps Lanæ.—A pure wool-fat. (Patented).—Pharm. Post, 1893, 106, 239.

Adeps Lanæ.—Some formulæ by Unna, using this ointment as a base. —Pharm. Post, 1893, 185.

Wool Fat—Detection of Foreign Fats in.—Helbing and Passmore.—Pharm. Zeit., xxxvii, 704, 712.

Wool Fat.—W. Groff.—Ibid., xxxviii, 62.

Lanolin—Estimation of.—Helbing and Passmore saponify by covering 5.3 Gm. anhydrous wool-fat with 20 C.c. alcoholic potassa lye in a strong flask containing about 50 C.c., stoppering and heating for two hours to 100° with occasional agitation.—Pharm. Zeit., 16, 1049; Zeitschr. Anal. Chem., 1893, 115.

——— *For Foreign Fats.*—Helbing and Passmore, in Helbing's Pharmacol. Record, Nov., 1892; Pharm. Centralh., 1893, p. 94.

——— A. Santi.—Monatsh. f. prakt. Dermat., Hamb., 1892, 269.

Lanolin-Milk.—20.0 parts powdered soap, 10.0 of powdered borax, 70.0 of water, 30.0 of cocoanut oil, 70.0 of hydrated lanolin, are triturated together for at least 10 minutes and 800.0 parts of warm rose-water (40° C.) gradually added; after agitation the preparation is perfumed with the oils of bergamot and orange flower, each, gtt. x; rose, gtt. v, and wintergreen gtt. i.—E. Dietterich, Pharm. Ztg., 1892, 429.

Lanain.—Lanain, patented as a pure neutral wool-fat, is put upon the market as a soft, yellowish, homogeneous mass, melting at about 36° C.; it has only a faint odor indicative of its origin, and loses this after some time; applied to the skin, this odor is not persistent; it is perfectly neutral in reaction and permanent in air. By mixing with water, it changes to a white, smeary ointment, the surface of which becomes brown on exposure; it is possible to incorporate as much as four times its own weight of water; by incorporating 25 per cent. of water lanolin is obtainable. Lanain is very quickly absorbed by the skin, so that this property, also possessed by lanolin, is not due to the water contained in the latter. Lanain is offered as a substitute for the different fats and some fixed oils in the preparation of ointments, pomades, etc.—Dr. H. Hirzel, Apotheker Ztg., 1893, 57.

Lanolinum Anhydricum and Adeps Lanæ.—O. Liebreich compares the value of both these substances and is in favor of lanolin.—Pharm. Zeit., 1893, 235; Pharm. Post, 1893, 323.

Lanolimentum Boroglycerini.—Formula in Zeits. Oest. Apoth. Ver., 1893, 348.

Oesipus, the crude fat from which lanolin is extracted, has come into use in dermatology. It is hard and has a bad odor, but the one objection can be overcome by adding sweet oil, and the second by some aromatic. —Notes on New Rem., 1892, 72.

Oesipus Preparations.—Tänzer and Ihle (Monats. f. Prakt. Derm.: Nat. Drug.):

NEUTRAL PASTE.

Suint	10 parts.
Olive oil	10 parts.
Oxide of zinc or starch, sufficient.	

Mix and make a paste.

Useful in all humid eruptions (eczema vesiculosus, bullæ, burns of the first and second degree, impetigo, impetiginous eczema, etc.)

SUINT AND BISMUTH SUBNITRATE.

Bismuth subnitrate	5 parts.
Zinc oxide	10 parts.

Mix, and add suint and olive oil in equal parts sufficient to make a paste.

Useful in sycosis, which it usually cures in two or three weeks. The suint can be mixed in the same manner with salicylic acid, orcein, or resorcin.

PASTE OF SUINT AND ZINC OXIDE.

Suint	10 parts.
Olive oil	10 parts.

Gray oxide of zinc, sufficient.
Mix and make paste.

Useful in rebellious dry eczema of the face in childhood.

SUINT AND STARCH.

Suint	10 parts.
Olive oil	10 parts.
Starch	20-25 parts.

Mix.

Useful in rebellious moist eczema of the face in childhood.

Cod-Liver Oil.—Statistics of production in Norway for 1892.—Chem. and Drug., July, 1892, 24.

Cod-Liver Oil Therapy—The Fallacy of.—The Pacific Drug., 1893, 17; from Merck's Market Report.

——— Iodated, Ferrated and Iodo-Ferrated.—The *iodized oil* is made by adding 1 Gm. of iodine and 2 Gm. of chloroform to 999 Gm. of cod-liver oil. The solution should be effected cold and in a mortar. The product has the color, odor, and flavor of cod-liver oil; it does not color starch.—To make the *ferrated oil*, mix 3 Gm. of sublimated perchloride of iron with 997 Gm. of oil. The solution should be made in a mortar, and the product filtered if necessary.—The *iodo-ferrated oil* has been prepared, thus far, by digesting iodine and powdered scales of oxide of iron with the oil. The product is not uniform, as the iodine is apt to combine with the oil, leaving the major part of the iron unchanged. But if a slight excess of iron, with a little ether, be triturated with the oil, an anhydrous iodide of iron will be formed, and this, like the anhydrous chloride of iron, dissolves easily in cod-liver oil. The proper proportions are: 2 Gm. of powdered iron scales; 4 Gm. of iodine; and 40 Gm. of oil, with a little ether; the whole to be triturated in a mortar until all of the iodine shall have disappeared and a black product formed. A sufficient quantity

of oil is then added to make 1,000 Gm. The product should be filtered. Iodo ferrated cod-liver oil has a reddish-brown color and contains of iodide of iron 5 : 1000.—L'Union Pharm.; Bull. Pharm., 1892, 560.

Cod-Liver Oil.—Ferro-Iodized.—C. Diete, in Chem. Zeit.; Pharm. Centralh., 1892, 191.

Porphyrized iron	4 Gm.
Iodine	8.20 Gm.
Ether	70 Gm.

Mix and agitate until all the iron is converted into iodide. Then heat in a water-bath 200 Gm. of cod-liver oil; add the ethereal solution of iodide of iron, and continue the heat until the ether is driven off. Let cool, and filter. This preparation should be preserved in small containers only.

——— *with Saccharin.*—Mittelbach.—(Pharm. Centralh., 1893, 116.)

Cod-liver oil	100 parts.
Saccharin	0.4 parts.
Acetic ether	2.0 parts.

Dissolve the saccharin in the acetic ether, add gradually to the oil, shaking well meanwhile. This may then be flavored to suit the taste with oil of peppermint, cinnamon or other agent.

Corrective for Cod-liver Oil.—For disguising the taste of cod-liver oil 100 Gm. of it are recommended to be flavored with three or four drops of a mixture consisting of the volatile oils of wintergreen, 4; sassafras, 4, and neroli, 2 parts.—Gazz. d. Ospit., 1892, No. 73; Am. Jour. Pharm., 1892, 473.

Leeches.—The micro-organism causing a disease among leeches has been found by H. Werner, of Bolchen (Pharm. Zeit., 1892). The epizoötic known as "Schleimkrankheit," "mucus disease," is characterized by an excessive secretion, or accumulation, of the normal mucus covering of the leech, and is very fatal to the worm. In seeking the cause of this affection, H. Werner discovered the invariable presence of a micro-organism in countless numbers in the mucus on the body, and particularly in the mouth of the animal.

Morphologically, the organism is closely allied to the Pneumococcus, being somewhat smaller than the latter. The bacterium is a coccus, in outline round and oval, often angular. They stain readily, by the same means used to stain tubercle bacilli, *e. g.*, methyl-violet or carbol-fuchsin. Cultures of the coccus in gelatin were successfully made. They developed well at 10° C., and rapidly at 15° C., the gelatin being liquefied during their growth. Oxygen was destructive to the microbe.

In view of this discovery H. Werner recommends as treatment for leeches thus diseased, that they be washed off in some antiseptic, for instance a weak solution of salicylic acid, or that charcoal be kept in the jar containing the leeches.—Meyer Bros.' Drug., 1892, 311.

Musk—A Contribution to the History of.—E. Noelting, in Chem. Zeit, 1893, 169.

American Musk.—R. S. Christiani.—Pharm. Record, 1893, 193.

Ox-Gall of Flatner—Crystallized.—This is prepared (Jour. de Pharm. d'Anvers; L'Union pharm., 1892, 382) by mixing the ox-gall with charcoal and carefully evaporating to dryness. The residue is then treated with absolute alcohol, filtered, and to the filtrate ether is gradually added so as to form a perfect mixture. Crystals form gradually, which are separated and dried over sulphuric acid. The crystals are white, inodorous, of a slightly bitter taste, and are very soluble in alcohol and water and insoluble in ether. The product consists of a mixture of glycocholate and taurocholate of sodium.

Ox-Gall—The Acids of.—Lassar-Cohn.—Ber. d. Chem. Ges., xxvi, 146.

——— *Presence of Myristic Acid in.*—Lassar-Cohn.—Ber. d. Chem. Ges., xxv, 1829.

Pepsin—The Manufacture of—and Determination of its Proteolytic Power.—A valuable paper on the different processes used in the manufacture of powdered, scale and crystal pepsins.

Beal's Process.—Dr. Lionel Beal suggested taking the inner coat of the fresh pig's stomach, and after well washing and cleansing it, to scrape it with a blunt knife, and dry the viscid fluid so obtained on glass plates; and afterwards treat it with benzol, ether or chloroform, to extract fat, again dry it, and reduce to fine powder.

Scheffer's Process.—Scheffer availed himself of the fact that albuminous matter is thrown out of solution by the addition of salt in sufficient quantity to form a nearly concentrated solution of pepsin.

Scale and Pepsin Crystals.—Besides these powdered pepsins, more elegant preparations known as scale and crystal pepsins are in the market, some of these being of very good quality and strength. These preparations are made entirely from the inner coatings of the pigs' stomachs. The latter are washed and passed through a mincing machine, the resultant mass digested with diluted hydrochloric acid. The amount of peptone increases with the length of time during which digestion is carried on, and also with the increase of temperature. The solution is strained, and if clear either evaporated in vacuo or placed in shallow trays and further evaporated to a syrupy fluid, at a temperature not higher than 112° F.; finally spread upon glass plates and scaled in a proper scaling room.

The so-called crystal pepsin, or peptone pepsin, is prepared in exactly the same way as the scales, except that instead of thin scales being formed, the concentrated pepsin solution is dried in thicker sheets, like fine glue, and broken up when dry into small pieces. The words crystal and peptone, applied to this class of preparations, are both inappropriate, since they are neither crystalline nor true peptones, but rather mixtures of pepsin and syntonin, with a little peptone. The pepsin is not improved by these additions; they are, in fact, mere unavoidable impurities, without which the pepsin would be of greater strength.

Purification of Pepsins.—Sulphate of soda and sulphurous acid are proposed.

Patents for Pepsin Manufacture.—C. Jensen, J. Le Roy Webber and J. B. Russell have patented improvements for the manufacture of pepsin.

Characteristics of Good Pepsins.—All good pepsins should be of a light color; the scales a light lemon, slightly greenish and nearly transparent; the powder white, or nearly so. They should be soluble in water, with a characteristic, but not offensive or putrescent smell, nor should they be very hygroscopic. Deficiency in any of these respects is usually due to faulty manufacture, or to the presence of mucus, albumin, peptone or inert animal tissue. The digestive power of good pepsin should be near 2,000 times its own weight.

Test for Pepsins.—The different official tests for ascertaining the digestive strength of pepsin are perhaps sufficient to ascertain if a sample is above, below, or of, the required standard; but they do not give the actual strength. There is no recognized test which under all circumstances will give uniform, impartial results, and slight variations in the manipulation will frequently occasion widely different results with the same pepsin. It must also be borne in mind that the real digestive power of a pepsin is measured by the amount of peptone which it is able to produce in a given time under certain conditions; while, at present, it is usual to be satisfied with ascertaining the amount of albumin dissolved. The first step in the digestive action of pepsin on coagulated albumin is the conversion of the latter into soluble acid albumin, or syntonin, from which state it is subsequently converted into parapeptone, and then into peptone proper. A weak pepsin may dissolve all the albumin and convert it simply into syntonin, but fail to carry the digestion further, and may not produce peptone, whilst a much stronger pepsin may, in the same time, convert the albumin not only into syntonin, but also into peptone. So far as appearance goes, both samples would appear to have done equal work, the albumin being dissolved in both instances; while, in reality, the one is double the strength of the other. It must also be remembered that in testing a sample of pepsin the results are materially influenced by various conditions. Pepsin, if allowed to act on more albumin than it can digest, will convert the albu-

min principally into syntonin and produce very little or no peptone at all. Being undialyzable also, it cannot penetrate the albumin, and exerts its dissolving power only on the outer surface of it; it is therefore evident that the more finely divided the albumin is, the greater will be its outer surface, and the more readily will it be acted on and dissolved. Syntonin and peptone are also more soluble in weak solutions; 100 grains of albumin require about 1 ounce of acidulated water for solution; if less water is used, the solution is retarded.

The activity of different pepsins varies, and as it is difficult to estimate the undissolved portion of albumin, which after four hours of digestion is always in a more or less advanced state of digestion, it is best to regulate the amount of albumin in such a manner that after the termination of the experiment it is, as nearly as possible, completely dissolved. To effect this, one or two preliminary tests will be required before beginning the ultimate experiment. In fact, those who have from time to time to examine samples of pepsin and desire to get uniform results, will find it requisite to see that their experiments are each time carried on under precisely the same conditions, and to pay attention to the following points: The eggs used must be fresh; the time during which the eggs are boiled must be uniform, as must also the degree of fineness to which the coagulated albumin is reduced, the proportion of albumin and acidulated water used, the degree of acidity of the acidulated water, the temperature at which digestion is carried on, the time required to effect solution of the albumin, and the agitation of the mixture during digestion. It will be serviceable to take a sample of the best pepsin obtainable as a standard, and compare any pepsin under examination with it, so as to ascertain how much of any pepsin is required to produce the same results with the same amount of albumin, fluid and acid, with the same degree of heat, during the same period of digestion, and with the same amount of agitation. Fresh eggs are placed in cold water, heat applied until the water boils, and the eggs kept in the boiling water for fifteen minutes. They are then taken out, plunged in cold water to cool, the coagulated white of egg then separated from the yolk, and rubbed and squeezed through a sieve of thirty meshes to the square inch. Two hundred grains of this finely-divided albumin are triturated in a mortar with distilled water, containing 5 minims of strong hydrochloric acid to the ounce. When well-triturated the mixture is put in a wide-mouth bottle and sufficient acidulated water added to make the whole measure 2 fluidounces. One-tenth of a grain of the pepsin under examination is then added, and the whole digested for four hours at a temperature of 104° F., shaking the bottle every ten minutes. The pepsin is best mixed with four times its weight of sugar of milk, and a proportionate quantity of this mixture used. When of good quality, one-tenth of a grain of pepsin will dissolve the whole of the 200 grains of albumin. It is best to make comparative experiment with a standard

pepsin of great and known strength, and also with a flask containing the same amount of albumin and acidulated water, but no pepsin. Should the pepsin under examination not dissolve all the albumin, comparison with the flask containing no pepsin will show approximately how much has been dissolved, and help to indicate how much more pepsin to use in a second experiment, to dissolve all the albumin, so as to effect perfect solution.

Should it be necessary to ascertain how much peptone and how much syntonin are formed during the digestion, the mixture should be boiled, to destroy any further action of the pepsin. The solution is then filtered from any undissolved albumin, and the filtered solution, while still warm, neutralized with sodium carbonate, when syntonin will be thrown down. The difference between the syntonin and undissolved albumin and the original amount of albumin used in the experiment will give the amount of real peptone formed during the process of digestion.—Pharm. Jour. and Trans., 1893, 588.

Pepsin.—At a meeting of the Berlin Pharmaceutical Society, F. Witte, speaking upon pepsin, stated that too stringent requirements regarding perfect solubility of pepsin were being made; that from his experience pepsins forming perfectly clear solutions had decreased albumin dissolving power. Pepsin dissolving 4,000 parts albumin could easily be made; he had been manufacturing, for American export, pepsin dissolving 10,000 parts of albumin for some time. At the Columbian Exposition he intended to exhibit an absolute pepsin, but declined to state anything regarding its albumin solvent power.—Pharm. Centralh., 1893, 92.

——— Pharm. Centralh., 1893, 150.

Pepsin.—J. Le Roy Webber announces that by the use of sodium sulphate at a moderately high temperature, he had succeeded in separating pepsin from peptone without injury to the ferment. This discovery has made it possible to manufacture a permanent and soluble pepsin possessing the extraordinary power of digesting 6,000 times its weight of coagulated egg-albumen by the six-hour test.—Pharm. Era, 1893, 51.

Pepsin Testing.—L. Friedländer.—Ber. d. Pharm. Ges., 1893, 65.

Pepsin—How Physicians Prescribe.—R. G. Eccles.—Brooklyn Med. Jour., 1892, 797.

Pepsin and its Incompatibles.—J. T. Fotheringham.—Canad. Pract., 1893, 102.

Pepsin.—Physiological tests according to the process of the Pharm. française and a modification of the same.—L. Portes, in Rep. de Pharm., 1893, 6.

"*Black Pepsin*" (so-called): Several government analyses recently made, show it to consist of about 83 per cent. of common salt, 2 per cent.

of rennet and other organic matter, and 15 per cent. of annatto, moisture, etc. Several examinations of butter made by its aid show 63 per cent. of fat.—Drug. Circ., May 1893.

Pepsin—Assay of.—See Assay.

Petrolatum.—Chas. Rice replies effectively and conclusively to a circular issued by the Chesebrough Manufacturing Company. The circular contains several statements which are not in accordance with the real facts, and several others which are a matter of opinion.—Pharm. Review, 1893, 1.

Vaselinum Lanolinatum.—Wells applies this name to an ointment base consisting of 25 parts of anhydrous lanolin, and 75 parts of vaseline. It is cheaper than lanolin and more efficacious than vaseline alone, and has the property of taking up 200 per cent. of water.—Rund., 1893, 235; Amer. Drug., 1893, 200.

Sponges—Fishing for.—Amer. Drug., 1892, 26.

Waxes.

Wax Secretion by Honey Bees.—A. J. Cook finds that bees require eleven pounds of honey to enable them to secrete one pound of wax. Huber's estimate was higher than this, whilst that of Viallon and Hasty was less.—Pharm. Jour. and Trans., 1892, 84; Bull. U. S. Dept. of Agriculture, xxvi.

Beeswax—Analysis of.—By C. Mangold. The author's investigations practically confirm those of Buisine, but he recommends the following process: 2 to 10 grams of the wax is saponified by melting it with powdered potash-lime, the reaction being aided by stirring with a glass rod. After complete cooling, the soap is powdered, and intimately mixed with three times its weight of potash-lime, and the powder transferred to a thick-walled, pear-shaped bulb-tube, which is heated for three hours at 250° in a mercury bath contained in an iron vessel. This is provided with a lid, which screws on air-tight, and is pierced with four apertures through which pass air-tight, respectively, the pear-shaped bulb, a thermometer, a thermostat, and a long tube open at both ends to condense any mercury vapor. A tube connects the pear-shaped bulb with a Hofmann's burette, in which the hydrogen is measured.

The author's process is, however, more particularly directed to the estimation of the paraffins. After three hours, when no more gas will be given off, the residue is powdered, and to prevent any loss the bulb-tube is also broken up, and the whole is extracted with light petroleum in a Soxhlet's apparatus. The petroleum is distilled off, and the residual paraffin dried at 110° and weighed. On applying the process to yellow beeswax of undoubtedly genuine origin, the amount of natural hydrocarbons was found to vary from 11.02 to 14.7 per cent., although in practice the average amount may be put down as 13.5 per cent.

A sample of Transylvania wax, tested by the author, had an acidity equivalent of 16.66, and a true saponification number of 56.02, which pointed to adulteration with paraffin, or a similar substance. Analyzed by the author's method, the percentage of hydrocarbons came, indeed, to 28.12, corresponding with 17 per cent. of adulteration, calculated on the original sample. A sample of wax, which had been purposely adulterated with 8 per cent. of paraffin, showed on analysis 7.4 per cent.

The amount of hydrocarbons in samples of white wax varied from 10.93 to 15.48 per cent., but the purity of some of the samples was rather doubtful.—Chem. Zeit., 15, 709; Jour Chem. Soc., 1892, 1034; Am. Jour. Phar., 1892, 533.

——— *by Hübl's Method.*—Antushevitch heats the wax over a free flame, with alcoholic potash for four hours to effect complete saponification. —Abstract. Jour. Chem. Soc., 1893, 198.

——— ——— Benedikt.—Chem. Zeit., 1892, 1922.

Wax Analysis—Qualitative and Quantitative.—Rottger concludes that the only trustworthy method for the detection of adulteration in wax is that recommended by Hübl.—Chem. Zeit., 1892, 1837.

Hübl's Process for Testing Wax.—Buchner recommends boiling with excess of normal alcoholic potash for at least one hour.—Chem. Zeit., 1892, 1922.

Beeswax.—A chemical examination by M. Mansfeld.—Zeits. Oest. Apoth. Ver., 1893, 327.

Resin in Beeswax—Detection of.—Rottger.—Chem Zeit., 1892, 15, 45.

Sp. Gr. of Wax—Determination of the.—K. Imendorffer in Sudd. Apoth. Zeit., 1892, 171; Pharm. Centralh., 1892, 444.

Vegetable Wax.—C. Bührer states that about 1,500,000 lbs. of vegetable wax were exported in 1889 from China, Japan and Tropical America.—Pharm. Jour. Trans., 1893, 728; from Zeits. f. Nath. Unters., Hygiene, u. Waarenk., 1892, 303.

Paraffin in Bees-wax.—Prom a hint in Allen's "Commercial Organic Analysis" regarding the detection of paraffin in bees-wax, and the estimation of the percentage present, a series of experiments were undertaken, and the following are the principal facts elicited:

Action of strong sulphuric acid on wax.

(a) Bees-wax at a temperature below 100° C. carbonizes, and above that temperature complete carbonization takes place with violent action The mixture swells up, and hard and knotty masses are formed; if the action be allowed to continue, spurting takes place, a tarry liquid being ejected.

(b) Japan wax carbonizes at a lower temperature, and the same with

(c) wax of Corypha cerifera.

(d) Wax of Myrica cerifera also carbonizes, and before carbonization takes place a faintly perceptible red color is produced. This, however, is probably a change in the green-coloring matter present.

An examination of wax (a) was continued. The cool mass was digested in chloroform, decolorized with animal charcoal, and filtered. The filtrate, evaporated spontaneously, left a residue.

In order to insure that the wax had been completely carbonized, the residue was again treated with sulphuric acid, and it gave colors from pink to violet. The residue had a cheesy odor, and was of a cream color. Owing to the non-charring it was assumed that the residue was paraffin, and the effect of sulphuric acid upon paraffin was accordingly tried.

Result: At 95° C. faint pink hue; between that and 120° the color darkens to beautiful violet; at 130° or 135° carbonization begins.

A specimen of white wax known to contain paraffin was treated with sulphuric acid. As soon as it had begun to carbonize, an oily film formed on the surface, and this gradually sought the edge of the dish, where it appeared as a transparent ring. When the charring mass began to appear in small brown granules, the heat was removed. The edge of the dish now had a violet-colored film over it, and this was assumed to be due to the paraffin present. On cooling, the paraffin could be readily removed from the edge, and it was seen to present a violet color. Removing the paraffin it was washed with water and dried with filtering paper; any adhering brown matter was gently removed with a knife; H_2SO_4 test brought out coloration.

Inference: Sulphuric acid can be used with good results to separate paraffin from beeswax; the wax should be shaved into thin shreds and dropped into the heated sulphuric acid. The carbonization should not be carried too far, in order that the paraffin may not be mixed up with the charred mass. These observations were made several years ago, and others, amongst them a German chemist, have confirmed the results.—Chem. and Drug., 1893, 85.

Insect Wax: The White Wax of China.—Pharm. Record, 1892, 344; from Chambers' Journal.

Gum-lac—The Wax of.—Examination by A. Gascard, in Jour. Pharm. Chim., 1893, 365–372. A very exhaustive research on this subject has been carried out by the author. By treating the lac in fine grains with 95 per cent. alcohol it is separated into three distinct bodies. The first is insoluble in the alcohol, and consists of the debris of dead insects, of certain nitrogenous bodies not yet studied, and of a waxy substance melting at 92° C. This latter can be extracted by means of benzene. The second, soluble in the cold, is the most important. It is the body which gives its resinous character to the lac, and is very useful for varnishes. Its composition is hardly yet understood, but Benedikt be-

lieves it to be a mixture of fatty acids. But M. Gascard finds it to contain nitrogen. The third portion is soluble in boiling alcohol, and is deposited, on cooling, in fine needles. It is this body to which the name above-mentioned, the wax of lac, is given. Combustions of the principal constituent of this wax, in a pure state, assign to it the formula, $C_{30}H_{60}(C_{30}H_{60}O_2)$, which is that of myricinmelissic ether. On saponification it yields an acid melting at 91°, whose character and composition are those of melissic acid, and an alcohol melting at 88° possessing the properties of ordinary myricin. In addition there are other ethers of myricin present and a quantity of the free alcohol, as well as of cerylic alcohol and free fatty acid.

Wax—Estimation of.—In testing beeswax qualitatively, Hager inserts a cylindrical piece of the substance into a large test-tube and covers it with petroleum benzine. The benzine gradually permeates it and causes the pure wax to resolve into small dust-like particles and very small flakes, which, after one or two hours standing, form a layer in the bottom of the tube, having a clear benzine solution above. Wax with foreign admixture is more or less resistant to the solvent action of benzine, and often remains unaffected after two or three days' treatment, but usually, after the lapse of half a day, a wax sediment forms, of a mixed consistency, interspersed with longitudinal cylinders or their parts. Dieterich tested wax that contained 5 and 20 per cent. ceresin, and found the test tolerably reliable, but not so if the percentage of admixture is five per cent. or less.—Helfenberger Annalen, 1892.

Wax and Honey—Cuban.—Statistics for 1890 and 1891.—Chem. and Drug., 1892, 925.

CHEMISTRY (INORGANIC) AND PHYSICS.

GENERAL AND THEORETICAL.

Leclanché Battery.—A contribution to the study of.—A. Ditte.—Compt. rend., April 17, 1893.

Alloisomerism.—Researches on.—A. Michael. Being researches consisting of memoirs.—Jour. f. prakt. Chem., xlvi, Part 5–7, etc.

Stereochemistry.—C. Priedel. A reply to M. Colson's paper (Compt. rend., cxvi, 994.)—Compt. rend., Feb. 20, 1893; Chem. News, 1893, 120. Continuation of discussion in Compt. rend., 1893.

The New Explanation of Pharmaceutical Chemistry, with Particular Regard to the Synthetic Remedies.—H. Erdman.—Pharm. Post, 1893, 294.

A Chemical Theory on a Basis of Physical Comparison.—Attempt to found.—Jaumann attempts to formulate a theory which might take the place of the atomic theory.—Abstract, Jour. Chem. Soc., 1893, 10.

New Diagram and Periodic Table of the Elements.—R. M. Deeley.—Jour. Chem. Soc., 1893, 852.

Calculation of Atomic Weights.—A general method; and deductions from the century's work on this matter.—Compt. rend., 116, 695.

Determination of Molecular Weight from the Rate of Evaporation.—H. Kronberg.—Abstract, Jour. Chem. Soc., 1893, 261.

New System of Atomic Weights, partly based on the Direct Determination of the Molecular Weights.—A. Leduc.—Compt. rend., cxvi, 383. Abstract, in Chem. News, 1893, 120.

Chemical Synthesis—Attempt at a General Method of.—R. Pictet.—Compt. rend., April 17, 1893.

Nitro-compounds—Formation of.—Ibid.

Chemical Action—General Theory of.—E. Maumené claims priority as against R. Pictet of the ascription to gravitation as performing a great part in chemical phenomena.—Bull. Soc. Chim. de Paris, ix and x, No. 2.

Nomenclature of Rings consisting of 2 Carbon and 3 Nitrogen Atoms.—F. Kehrmann and J. Messinger.—Ber. d. Chem. Ges., xxv, 901.

The Study of Chemistry Considered as an Education of the Mind.—Wm. Chattaway.—Pharm. Jour. Trans., 1893, 872.

Mathematics of Pharmaceutical Chemistry.—D. C. Mangan.—Pharm. Record, 1892, 444.

Gases.

Behavior of Some Metals with Gases.—G. Newmann. The portion of this work relative to the occluding power of hydrogen was executed by the author in conjunction with F. Streintz. They find the following metals capable of occluding gases: lead, palladium, platinum, gold, iron, nickel, aluminum and cobalt. Silver, according to the author's experiments, absorbs no hydrogen, whilst according to Graham, silver wire occludes 0.211 times its volume. Newmann examined the behavior of the precious metals with oxygen in a similar manner. He found silver, gold, platinum and palladium to occlude oxygen.—Zeit. f. Anal. Chem., 32, 72; Chem. News, March 10, 1893. (See also Ber. d. Chem. Ges., 14, 2, 643.)

Gases—The Chemistry of.—Lecture by Dewar.—Abstract in Nat. Drug., 1892, 33.

——— *Absorption Coefficient of.*—Henrich.—Abstract, Jour. Chem. Soc., 1892, 1043.

——— *Densities of the Principal.*—Rayleigh.—Chem. News, 1893, 183, etc.

Gases—Liquefaction of.—V. Cornish in Knowledge; Pharm. Record, 1892, 116; Nat. Drug., 1892, 89.

Illuminators—Auer's.—The discovery of Karl Auer that certain metallic oxides will greatly add to the luminosity of a flame, and which is familiar to all in the form of the oxy-hydrogen-lime light, has found a new and useful application (Phar. Zeit.). A Bunsen's burner is constructed, in which ordinary illuminating gas is diluted to such a degree that combustion takes place at a very low temperature, so that the carbon in the gas is not brought to a glow, but burnt only to carbon monoxide, the flame being blue. This non-luminous flame is directed against a cylinder, composed of a mixture of various metallic oxides, selected in such a manner that the compensation of their various specific spectra will produce a brilliant white light. But while these oxides will emit light of a certain intensity, an appropriate mixture of several will yield a light fully five times as powerful. One mixture is as follows: Magnesium oxide, 60; lanthanum oxide, 20; yttrium oxide, 20. Another combination is: Zirconium oxide, 60; lanthanum oxide, 30; yttrium oxide, 10. Also: Zirconium oxide and lanthanum oxide in equal proportions. These oxides are dissolved in acetic acid and so much water that the solution may contain 30 per cent. of the salts. With this solution cylindrical wicks of fibre are saturated and then dried. This cylinder is attached to a light frame of platinum wire by which it may be fastened on the gas-burner. On lighting, the fibre burns away, leaving a column of the oxides in solid mass. The advantages are an absolutely steady light of great intensity and purity, besides absence of unpleasant heat.—West. Drug., 1893, 26.

RULES FOR THE SPELLING AND PRONUNCIATION OF CHEMICAL TERMS.

The American Association for the Advancement of Science, at its meeting in 1887, appointed a committee to consider the question of attaining uniformity in the spelling and pronunciation of chemical terms. The work required extensive correspondence and detailed discussion, extending over four years, when in 1891 the following rules were adopted by the Association and recommended to chemists generally, but especially to those engaged in teaching, in the hope that they will cordially unite in the efforts to bring about uniformity in usage. The committee consisted of T. H. Norton, Ph.D., Professor of Chemistry, University of Cincinnati; Edward Hart, Ph.D., Professor of Chemistry, Lafayette College, Easton, Pa.; H. Carrington Bolton, Ph.D., University Club, New York; Jas. Lewis Howe, Ph.D., M. D., Polytechnic Society, Louisville, Ky. The rules have recently been republished by the Bureau of Education, and the spelling has been adopted by several chemical journals, and it is to be hoped that the desired uniformity may be reached before long, even though certain modifications may become desirable, the committee having been well aware that these rules are not to be regarded as final.

*General Principles of Pronunciation.**

(1) The pronunciation is as much in accord with the analogy of the English language as possible.

(2) Derivatives retain as far as possible the accent and pronunciation of the root word.

(3) Distinctly chemical compound words retain the accent and pronunciation of each portion.

(4) Similarly sounding endings for dissimilar compounds are avoided (hence **-id**, **-ite**).

Accent.†

In polysyllabic chemical words, the accent is generally on the antepenult; in words where the vowel of the penult is followed by the two consonants, and in all words ending in **-ic**, the accent is on the penult.

Prefixes.

All prefixes in strictly chemical words are regarded as parts of compound words, and retain their own pronunciation unchanged (as ā′ceto-, ā′mido-, ā′zo-, hy′dro-, ī′so-, nī′tro-, nītrō′so-).

Elements.

In words ending in **-ium**, the vowel of the antepenult is short if **i** (as īri′dium), or **y** (as didy′mium), or if before two consonants (as cā′lcium), but long otherwise (as tītā′nium, sĕlē′nium, chrō′mium).

alūminum.
a′ntimony,
a′rsĕnic,
bā′rium,
bi′smuth (biz),
bō′ron,
brō′min,
cā′dmium,
cālcium,
ca′rbon,
cē′rium,
cē′sium,
chlō′rin,
chrō′mium,
cō′balt,
colū′mbium,
co′pper,
didy′mium,
e′rbium,
flū′orin,
gā′llium,
germā′nium,
glū′cinum,
gold,
hy′drogen,
ī′ndium,
ī′ōdin,
īri′dium,
iron,
lā′nthanum,
lead,
lī′thium,
magnē′sium
(zhium),
ma′nganese
(eze),
me′rcury,
mōlybdenum,
nī′ckel,
nī′trogen,
ŏ′smium,
ō′xygen,
pallā′dium,
phōs′phorus,
plā′tinum,
potā′ssium,
rhō′dium,
rubī′dium,
ruthē′nium,
samā′rium,
scā′ndium,
sĕlē′nium,
si′licon,
silver,
sō′dium,
sū′lfur,
strō′ntium
(shium),
tāntalum,
tellū′rium,
te′rbium,
thā′llium,
thō′rium,
tin,
tītā′nium,
tū′ngsten,
ūrā′nium,
vānā′dium,
ytte′rbium,
y′ttrium,
zinc,
zircō′nium.

* Fāte, făt, fār, mēte, mĕt, pīne, pĭn, marīne, nōte, nŏt, mōve, tube, tŭb, rüle, my, y ĭ.

† ′ Primary accent; ″ secondary accent. N. B.—The accent follows the vowel of the syllable upon which the stress falls, but does not indicate the division of the word into syllables.

Also: ămmō'nium, phosphō'nium, hă'logen, cyă'nogen, ămī'dogen.

Note in the above list the spelling of the halogens, cesium and sulfur; **f** is used in the place of **ph** in all derivatives of sulfur (as sulfuric, sulfite, sulfo-, etc.).

Terminations in **-ic.**

The vowel of the penult in polysyllables is short (as cyă'nic, fūmă'ric, arsĕ'nic, silī'cic, ī̆ō'dic, būtyric), except (1) **u** when not before two consonants (as mercū'ric, prū'ssic), and (2) when the penult ends in a vowel (as benzō'ic, olē'ic); in dissyllables it is long except before two consonants (as bō'ric, cī'tric).

Exceptions: acē'tic or acĕ'tic.

The termination **-ic** is used for metals only where there is a contrast with **-ous** (thus avoid aluminic, ammonic, etc.).

Terminations in **-ous.**

The accent follows the general rule (as plā'tinous, sūlfurous, phō'sphorous; coba'ltous).

Exception: acē'tous.

Terminations in **-ate** *and* **-ite.**

The accent follows the general rule (as ă'cetāte, vă'nadāte); in the following words the accent is thrown back (as ă'bietāte, ă'lcoholāte, ă'cetonāte, ă'ntimonīte).

Terminations in **-id** (*formerly* **-ide**).

The final **e** is dropped in every case and the syllable pronounced **id** (as chlō'rid, ī'odīd, hy'drīd, ŏ'xīd, hydrŏx'id, sū'lfīd, ă'mīd, ă'nilīd, mūrĕ'xīd).

Terminations in **-ane, -ene, -ine** *and* **-one**

The vowel of these syllables is invariably long (as mĕ'thāne, ĕ'thāne, na'phthalēne, a'nthracēne, prō'pīne, quī'nōne, ă'cetōne, kē'tōne).

A few dissyllables have no distinct accent (as benzene, xylēne, cētēne.)

The termination **-ine** is used only in the case of doubly unsaturated hydrocarbons, according to Hofmann's grouping (as propīne.)

Terminations in **-in.**

In names of chemical elements and compounds of this class, which includes all those formerly ending in **-ine** (except doubly unsaturated hydrocarbons) the final **e** is dropped, and the syllable pronounced **-in** (as chlō'rīn, brō'mīn, etc., ă'mīn, ă'nilin, mo'rphin, quī'nin, vanī'lin, alloxă'ntin, absi'nthin, emū'lsīn, că'ffein, cō'cain.)

Terminations in **-ol.**

This termination, in the case of specific chemical compounds, is used exclusively for alcohols, and when so used is never followed by a final **e.**

The last syllable is pronounced **-ol** (as gly′cōl, phēnōl, crē′sōl, thy′mōl, (ti), gly′cerōl, quī′nōl.

Exceptions: ălcohŏl, a′rgōl.

Terminations in ***-ole.***

This termination is always pronounced **-ole**, and its use is limited to compounds, which are not alcohols (as ī′ndōle.)

Terminations in ***-yl.***

No final **e** is used; the syllable is pronounced **-yl** (as ă′cetyl, ă′myl, cē′rotyl, cē′tyl, ĕ′thyl.)

Terminations in ***-yde.***

The **y** is long (as ă′ldehyde).

Terminations in ***-meter.***

The accent follows the general rule (as hydrŏ′meter, barŏ′meter, lactŏ′-meter).

Exception: Words of this class used in the metric system are regarded as compound words, and each portion retains its own accent (as cĕ′ntime″-ter, mi′llime″ter, kī′lome″ter).

Miscellaneous Words

Which do not fall under the preceding rules.

Note the spelling: Albumen, albuminous, albuminiferous, asbestos, gramme, radical.

Note the pronunciation: A′lkalīne, a′lloy (n. & v.) a′llotrophy, a′llotropism, ī′somerism, pŏ′lymerism, apparā′tus (sing. & plu.) āqua regia, bary′ta, cĕn-tigrade, co′ncentrated, crystallin or crystallīne, electrŏ′lysis, liter, mŏlecule, mŏ′lē′cular, nō′menclā″ture, olē′fiant, vā′lence, ū′nivā″lent, bī′vā″lent, trī′vā″-lent, qua′drivā″lent, tī′trate.

A List of Words whose Use should be Avoided in Favor of the Accompanying Synonyms.

For	*Use*
beryllium,	glucinum,
niobium,	columbium,
thein,	caffein,
titer (n.),	strength or standard,
titer (v.),	titrate,
monovalent,	univalent,
divalent, etc.	bivalent, etc.
quantivalence,	valence,
sodic, calcic, zincic, nickelic, etc., chlorid, etc.	sodium, calcium, zinc, nickel, etc. chlorid, etc. (vid. terminations in **-ic** supra).

For	*Use*
arsenetted hydrogen,	arsin,
antimonetted hydrogen,	stibin,
phosphoretted hydrogen,	phosphin,
sulfuretted hydrogen, etc.	hydrogen sulfid, etc.
alkylogens,	alkylhaloids,
benzol,	benzene,
toluol, etc.	toluene, etc.
pyrocatechin,	catechol,
resorcin, etc.	resorcinol, etc.
hydroquinone (and hydrochinon),	quinol,
orcin,	orcinol,
hydrophlorone,	phlorol,
phloroglucin,	phloroglucol,
quercite,	quercitol,
pinite,	pinitol,
glycerin,	glycerol,
erythrite, erythroglucin, eryglucin, erythromannite, phycite,	erythrol,
mannite,	mannitol,
dulcite, etc.	dulcitol, etc.
sorbite,	sorbitol,
furfurol,	furfuraldehyde,
fucusol,	fucusaldehyde,
anisol,	methyl phenate,
phenetol,	ethyl phenate,
anethol,	methyl allyl-phenol.

Spelling and Pronunciation of Chemical Terms.—T. H. Norton.—Science, 1892, 272 and 291 ; Pharm. Rund., 1893, 59.

International Conference on Chemical Nomenclature.—Am. Chem. Jour., 1893, 50 ; from Nature, May, 1892.

Medical Terms—The Correct Pronunciation of.—W. D. Thomas and E. L. Crutchfield.—Maryland Med. Jour. ; Pharm. Record, 1892, 485.

Hydrochlorate or Hydrochloride.—The question as to the proper designation of the hydrochloric acid salts of alkaloids having been re-opened, Charles Rice expresses his views on this ever-recurring subject in a note recently published in the Notes on New Remedies. Mr. Rice, who is considered good authority on questions of this nature, adheres to the termination -ide as the more correct one. He says :

It is well known that, in English nomenclature, all salts derived from acids ending in -ic are designated by corresponding terms ending in -ate, thus : Sulphate denote a salt derived from sulphuric acid ; nitrate denotes a salt derived from nitric acid ; hydrochlorate denotes a salt derived from hydrochloric acid.

In all inorganic salts, it will be remembered, the formation of these compounds is accompanied by the elimination of one or more atoms of hydrogen from the molecule of the acid, the place of the eliminated hydrogen being taken by the basylous radical.—West. Drug., 1892, 372.

Isidiom.—Isidiom is the name suggested by Ladenburg for compounds which have different compositions but are very similar in chemical behavior; such compounds as hyoscine and scopolamine, pseudotropine and scopoline, cobalt and nickel, niobium and tantalum pentachlorides, benzene and thiopen, would come under the designation.—Chem. and Drug., 1892, 392.

Radical or Radicle.—According to Chem. and Drug.: "There are two ways in common use of spelling a word which seems to be going out of fashion in chemical literature, although its meaning is significant enough and the word itself is useful. We mean the 'radicle' of Watts' Dictionary, Fownes, Tilden and Miller; but Attfield, Dupré and Hake, Kolbe-Humpidge and Roscoe have it 'radical.' Which is it? We were inclined to give preference to radicle, on the supposition that the signification of the word was 'a little root;' but the matter having come before us for discussion in proof-reading, we find that authorities, so far as we have referred to them above, are at variance, and that the true origin of the term is to be looked for not in 'a little root,' but in the more expressive adjectival expression, 'serving to originate.' In this sense, according to Brande, it is 'the base, as applied to acids, as sulphur is the radical of sulphuric acid.' Professor Attfield, who is generally precise in matters of nomenclature, says 'elements are termed radicals, each being the common root (radix) in a series of salts.' Also, that 'a few modern authors term these roots radicles—a word more usefully expressive of the little roots or rootlets.' The fact that radicle is still used in several of the best text books shows that the subject has not had the attention which it deserves, and it would be well if we had an attempt at uniformity in the matter."

Chemical Literature—Tenth Annual Report of the Committee on Indexing.—From Advance Proofs of the Proc. of Amer. Assoc. for the Adv. of Sci., 1892; Chem. News, 1892, 145.

Solutions.

Solutions—A Definition of.—C. E. Linebarger.—Science, 1892, 352.

——— *Theory of.*—Van't Hoff replies to some objections raised by Lothar Meyer against the osmotic pressure theory of solution.—Abstract, Jour. Chem. Soc., 1892, 1045.

——— Am. Chem. Jour., 1893, 137, 290.

Solutions—Nature of.—A. Reychler.—Bull. Soc. Chim., vii, 812; Jour. Chem. Soc., 1893, 315.

Nature of Colloid.—Linebarger.—Abstract, Jour. Chem. Soc., 1892, 766.

——— *A Study of.*—W. L. Scoville.—Pharm. Review, 1893, 41.

Percentage Solutions.—Discussion in Pharm. Jour. Trans., 1892, 49, 60.

Diffusion Theory.—Wiedeburg replies to the objections raised by Arrhenius against his experimental methods and modes of calculation.—Zeit. physikal. Chem., 10, 509.

Double Salts in Solution—On the Existence of.—C. E. Linebarger.—Am. Chem. Jour., 1893, 337.

Solution in the Cold—Rapid Method of.—J. B. Coleman finds that by passing a current of air, or moist air or coal gas, through the coarsely-powdered solid substance suspended in water, complete solution is obtained, in some cases in 15 minutes, and in most cases before the expiration of an hour.—J. Soc. Chem. Ind., 10, 231; Jour. Chem. Soc., 1892, 397; Am. Jour. Pharm., 1892, 375.

Solubilities.—A. Etard. Gay-Lussac represented solubility at saturation graphically by plotting out the temperatures as abscissæ and the variable quantities of a salt which 100 parts of water can dissolve as ordinates. The author takes the ordinates as proportional, not to the quantity of the salt dissolved by the fixed and arbitrary amount of 100 parts of water, but to the weight of the salt contained in 100 parts of the saturated solution.—Bull. Soc. Chim. de Paris, No. 3; Chem. News, 1893, 164.

Theory of Heat, of Solution and of Osmotic Pressure.—C. Dieterici.—Abstract, Jour. Chem. Soc., 1892, 765.

Action of Temperature on the Rotatory Power of Liquids.—A. Aigan.—Compt. Rend., March 27, 1893; Abstract. Chem. News, 1893, 194.

Temperature of Maximum Density of Mixtures of Alcohol and Water.—De Coppet gives a table compiled from his own observations and those of Desfretz and Rosetti.—Compt. rend., cxv, 652.

Mixtures of Ether and Water.—L. Marchis discusses the vapor tension.—Abstract, Chem. News, 1893, 121; from Compt. rend., Feb. 20, 1893.

Change of Volumes of Solutions of Salts.—Skubich.—Abstract, Jour. Chem. Soc., 1892, 766.

Form, Purity and Size of Crystals separating from a Solution—Influence of Foreign Substances on the.—J. W. Retgers.—Abstract, Jour. Chem. Soc., 1892, 937.

Specific Gravities of Aqueous Solutions.—G. Charpy.—Abstract Jour. Chem. Soc., 1892, 765.

Rise of Salt Solutions in Bibulous Papers.—E. Fischer and E. Schmidmer.—Schönbein's experiments have shown that when bibulous paper is dipped into an aqueous solution of a salt, the water rises more quickly than the salt, and that the relative height attained by the latter is different for

different substances; it is possible, therefore, to recognize the presence of the several constituents of a solution by taking advantage of this difference in behaviour. The authors are of the opinion that the separation referred to is brought about by the difference in the diffusibility of the dissolved substances, a view which is supported by the fact that in the case of two salts, the one with the greater diffusive velocity rises more rapidly in the bibulous paper; the diffusion phenomena of all solutions which moisten bibulous paper can, in fact, be studied in this way just as well as with the aid of membranes. The apparatus employed for the purpose consists of a glass tube, in which six cylindrical rolls of bibulous paper are placed end to end, so that they are in close contact with the walls of the tube and with one another; the end of the tube is then dipped into the solution to be examined, and kept vertically in this position at the ordinary temperature until the fifth roll is thoroughly moistened, which is usually the case at the end of three or four days' time. The glass tube is then broken at the points where the rolls touch one another, the papers separately extracted with water, and the solutions examined.—Am. Jour. Pharm., 1893, 289; from Jour. Chem. Soc., Abstr., 109; from Annal. der. Chem., 272, 156.

Complex Acids containing Heptavalent Iodine.—Blomstrand.—Abstract, Jour. Chem. Soc., 1893, 122.

Spectroscopy—Some Facts about.—Nat. Drug., 1892, 36; from Pop. Sci. News.

Vapor Density—Determination of.—A supplementary note to the previous papers on this subject.—Ber. d. Chem. Ges., xxv, 1490.

Inorganic Pharmaceutical Chemistry—A Course in.—By F. J. Wulling.—Pharm. Record, 1892 and 1893.

Italian Chemical Works.—Phar. Jour. Trans., 1893, 810; from Consular Rep., 1892, 1122.

Analytical.

Testing of Drugs and Chemicals—Every Day.—A. S. Benham describes a convenient and satisfactory method of testing and recording the examination of every parcel of drugs and chemicals purchased by the apothecary.—Amer. Drug., 1892, 106.

Crucible—The Gooch.—T. Paul gives a supplement to the original memoir.—Chem. News, 1893, 8.

Chemical Action between Solids.—W. Hallock.—Bull. U. S. Geol. Survey, No. 64; Chem. News, 1893, 43.

Errors ensuing in Chemical Operations owing to the Employment of Gas Flames.—A. Lieben.—Abstract, Jour. Chem. Soc., 1892, 1374.

Quantitative Analysis—New Methods for.—A. Baumann.—Zeit. f. angew. Chem.; Chem. News, 1892, 181, etc.

Reactions at High Temperatures—Execution of.—W. Hempel.—Ber. d. Chem. Ges., 28, 3388.

Flame—Characterization of.—N. Teclu.—Jour. f. prakt. Chem., 44, 246. Illustrated.

Melting Point of Inorganic Substances—New Method of Determining the.—A. Potilitzin.—Abstract, Jour. Chem. Soc., 1893, 314.

New Boiling and Distilling Vessel.—T. Frederking describes a patented vessel.—Chem. News, 1893, 39.

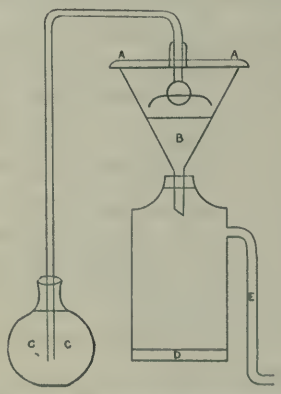
Chemical Analysis—Proximate Methods in.—G. Michaud.—Scien. Amer. Sup.; Pharm. Record, 1892, 138.

Metallic Compounds—A Volatile Series of.—C. F. Townsend.—Nat. Drug., 1893, 64; from Knowledge.

Chemical Synthesis—General Method of.—R. Pictet. According to the theory of the author, all chemical action should be impossible at very low temperatures. A series of interesting experiments which he has executed, lead to the conclusion that no action whatever takes place between the temperatures —125° and —155°, no matter what the nature of the reacting substances.—Am. Jour. Pharm., 1893, 312; from Compt. rend., 115, 708 and 814; Jour. Chem. Soc., Abstr., 1893, 112.

Apparatus for Washing Precipitates.—Matthew Forbes. The following simple apparatus for the washing of precipitates will be found to be of much advantage, especially when washing gelatinous ones:

FIG. 60.



Apparatus for Washing Precipitates.

A, Lead and rubber discs. B, Precipitate and fluid. C, Washing fluid. D, Filtrate. E, Tube leading to filter pump.

Procure a lead disc about ¼ inch thick and a little larger than the funnel that is used, with a true face and a projection on the centre of the

other side, with a hole bored through ($\frac{5}{16}$) to admit of a piece of glass tubing passing easily through; then blow a small bulb on one end of the tube and pierce four small holes with a needle through the side of it while held in the flame; then get a disc of the thinnest India-rubber and punch a hole smaller than the glass tubing, and pass tubing through both discs and projecting beyond the other side, and slip on a piece of India-rubber tubing to embrace both glass tubing and projection on lead disc; and to the other end of rubber tubing connect a convenient length of tubing to be led into a flask or jar of the washing fluid to be used.

Now throw the precipitate into the funnel with ground face, and wash it down on filter paper as much together as possible, and leave a little more fluid in the funnel than you wish to have during washing. Now moisten the discs with water, and place on the funnel, pressing them firmly down and around a little, and start the filter pump; the result of which will be that as the fluid is withdrawn from the funnel the washing fluid in the flask will pass over to replace it (if all the joints are air-tight), and will now wash as long as one chooses, simply by keeping the flask supplied with washing fluid, and leaving one free to work at something else.

The apparatus washes very quietly and does not disturb the precipitate, the fluid acting more as a series of layers of fluids passing through a precipitate.

In the event of the small bulb dipping into the fluid in funnel, lift out the tubing from the flask before stopping filter pump, as otherwise some of the precipitate might be carried back to the flask when the filter pump is stopped.—Chem. News, 1892, 55.

Schweissinger's Reagent for Alkalies.—This is prepared as follows: Dissolve equal parts of iodine and tannic acid in absolute alcohol, and mix the solution. It produces a transient rose coloration, in dilute solutions of any salt having an alkaline reaction. The test is so pronounced that with carbonate of potassium the said color is perceptible in a solution which contains only 1 part of the alkali in 1,000,000 parts of water.—Brit. and Col. Drug.; Pharm. Era, 1892, 143.

Molybdate of Ammonium as Reagent—F. Gigli (Boll. chim. farm., xxxi, 1892, 235, through Rép. de Pharm., 1892, 315), uses the following solutions for preparing the reagent for phosphoric acid extemporaneously. Fifteen Gm. of commercial ammonium molybdate are dissolved in the minimum amount of ammonia, and the solution diluted with distilled water to 100 C.c. The second solution is nitric acid, sp. gr. 1.185, containing 30 per cent. of HNO_3. The solutions are mixed when needed, 1 C.c. of the molybdate solution being added to 2 or 3 C.c. dilute nitric acid, and to this the liquid to be tested. In presence of phosphoric acid a lemon-yellow precipitate rapidly appears without the application of heat, one condition being that the testing be carried on in a slightly acid solution.—Am. Jour. Pharm., 1892, 572.

Members of H_2S Group—Quantitative Separation in a Current of Bromine.—Jannasch and Etz.—Ber. d. Chem. Ges., xxv, 736.

Separation of the Metals Precipitated by Hydrogen Sulphide in Acid Solutions.—Antony and Niccoli.—Gaz., xxii, 408; Jour. Chem. Soc., 1893, 192.

Separation of Mercury from the Metals of the So-called Arsenic and Copper Groups.—K. Bülow.—Chem. News, 1893, 174; from Zeitschr. f. anal. Chem., 1892, 697.

Nickel in Presence of Cobalt—Recognition of.—L. Lafay (Journ. de Pharm. et de Chim., 1892, 24, p. 67,) publishes a method for the recognition of these metals, which is based on the following reaction; Prepare a 5 per cent. solution of chloride of cobalt, and add an equal volume of a concentrated solution of potassium bichromate and a large excess of ammonia; on adding to 4 or 5 C.c. of this solution a large excess of solution of potassium hydrate, a precipitate is formed which redissolves in the liquid, forming a greenish and limpid solution. A salt of nickel treated in like manner yields a precipitate which does not redissolve. In case of a mixture of the salts, potassa yields a precipitate from which the cobalt is extracted by a large excess of the precipitant.

Iron, Aluminum and Chromium.—Separation of. Marchal and Wiernik employ freshly precipitated, well washed manganese dioxide.—Zeitschr. f. angew. Chem., 1891, 511; Jour. Chem. Soc., 1893, 49.

Separating Ferric Oxide from Alumina.—Beilstein and Luther.—Zeitschr. f. analyt. Chem., xxxi, 206. Bornträger, ibid., xxiii, 187.

Chromium—Volumetric Estimation of.—Perrault has devised a modification of Carnot's hydrogen peroxide method.—Chem. Centralb., 1892, 807; Jour. Chem. Soc., 1893, 194.

Barium, Strontium and Calcium—Separation of.—R. Fresenius.—Zeitschr. f. anal. Chem., 1893, 312.

Barium in Presence of Calcium and Magnesium—Determination of.—Mar.—Am. Jour. Sci., June, 1892; Chem. News, 1892, 154.

Barium and Strontium—Saparation of.—Philip E. Browning, in studying the action of amyl alcohol on the bromides of these bases, found that the solubility of barium bromide is about 0.0013 gram of the oxide in 10 C.c. of amyl alcohol, while that of strontium bromide is 0.2 gram. To obtain the bromides, the precipitated and thoroughly washed carbonates of Ba and Sr are treated with hydrobromic acid obtained by the action of dilute sulphuric acid on potassium bromide.—Chem. and Drug., 1893, 417.

Quantitative Separation of Barium from Calcium by the Action of Amyl Alcohol on the Nitrates.—P. E. Browning.—Am. Jour. Sci., April, 1892; Chem. News, July, 1892, 3.

Solubility of Strontium and Calcium Chromates in dilute Alcohol, and on the Possibility of Separating these Two Alkaline Earths as Chromates. —W. Fresenius and F. Ruppert. A qualitative but not a quantitative separation.—Zeitschr. f. anal. Chem., xxx, Part 6.

Free Alkali in Commercial Hypochlorites—Estimation of.—Blattner recommends one of three methods.—Chem. Zeit., xvi, 885. An abstract of all three methods appears in Jour. Chem. Soc, 1893, 91.

Acidulous Radicals—A Suggested Course for the Detection and Separation of the More Ordinary.—F. Harrison.—Chem. News, 1892, 26.

Nitro Explosives—Notes on the Analysis of.—P. G. Sanford.—Jour. Anal. and App. Chem., June 1892.

Estimation of Chloride in Presence of Hypochlorite and Chlorate.—M. Rosenbaum.—Zeits. f. angew. Chem., 1893, 80.

Separation of Iodine, Bromine and Chlorine. — By C. Schierholz. When each of the three halogens is present in fair quantity, the author adopts an indirect method, in which two weighings only are necessary. If only a small quantity of iodine and bromine is present with relatively much chlorine, the method of estimation depends on the facts that silver iodide is insoluble in moderately concentrated solutions of sodium chloride, and that bromine and chlorine can be separated by distillation with solutions of potassium permanganate and aluminum sulphate. The author has incidentally investigated the solubility of silver chloride, bromide and iodide in solutions of the halogen salts of the alkalies, more particularly in sodium chloride. Such solutions at their boiling point dissolve 4–5 times as much of the halogen salts of silver as at the ordinary temperature.—Am. Jour. Pharm., 1892, 574–576; from Jour. Chem. Soc., 1892, 1028; Monatsh., 13, 1–39.

——— E. P. Dunnington.—Jour. Anal. and App. Chem., vi, 611.

——— J. Forrey.—Ibid., No. 12.

Detecting Chlorine and Bromine in Presence of Iodine.—MacNair.—Chem. News, 1892, 5.

Separation of Iodine and Chlorine.—Jannasch and Aschoff.—Zeitschr. f. anorg. Chem., 1892, 248.

Separation and Estimation of Chlorine, Bromine and Iodine.—A new method by Friedheim and Meyer.—Zeit. anorg. Chem., i, 407.

Determination of Iodine in Haloid Salts by the Action of Arsenic Acid. —Gooch and Browning.—Am. Jour. Sci., April, 1893.

Detection of Iodates and Iodides.—Robineau and Rollin.—Abstract, Jour. Chem. Soc., 1893, 183.

Test Paper for Chlorides.—Heogalict (Pharm. Weekblad) prepares this

by precipitating silver nitrate with potassium chromate, and dissolving the precipitate in strong ammonia-water. Pieces of paper of convenient size are dipped in this solution, and then, while moist, drawn through a solution of nitric acid. When dry, the paper is red, but loses its color when dipped in a chloride solution.

Alkalimetry and Acidimetry.

Alkalimetry for Pharmacists—Some Practical Suggestions in.—Wm. Glenn.—Pharm. Rev., 1892, 121.

Acidimetry—Preparation of Borax Solution for.—T. Salzer, in Pharm. Centralh., 1893, 205.

Standardizing Acidimetric and Alkalimetric Solutions.—Parsons J. (Anal. and App. Chem., vi, 372 *et seq.*), concludes from his experiments that the most accurate method of standardizing is with potassium tetroxalate (volumetrically). Of the gravimetric methods the determination (of standard HCl) by precipitation as AgCl is given the preference. The tetroxalate, as usually obtained, frequently contains more or less acid (bi)oxalate. Using an excess of oxalic acid for the first crystallization, and keeping the solution hot for an hour or more before cooling to crystallize out, are especially advised. No material gain or loss by exposure to ordinary conditions, or by drying over sulphuric acid, was detected. Litmus was found to be the best indicator with it. The point taken is the distinct appearance of the blue (adding an alkaline solution from the burette). Cochineal, methyl orange and turmeric, are unsatisfactory. Acid potassium tartrate, strongly recommended by Bornträger (vid. Quarterly, xiii, 175), was found to be more difficult of preparation, as it tends to retain an excess of acid. Bornträger's directions are not sufficient for obtaining a salt of the necessary purity.—S. of M. Quart., 1893, 62.

Standardizing Alkalimetric Solutions.—Weld (J. Anal. and App. Chem., vi, 191) has tested standardizing HCl gravimetrically and volumetrically with $AgNO_3$, exactly neutralizing with ammonia and distilling with NaOH, neutralizing with $NaHCO_3$, etc. His conclusions are: 1, that the gravimetric method gives too low results; 2, that the distillation of an ammonia salt with NaOH gives too high results; and 3, that the true value of standard solutions may be obtained very closely with either soda, potassium tetroxalate, oxalic acid, or sodium bicarbonate. Potassium tetroxalate was found to possess many disadvantages.—S. of M. Quart., July, 1893, 380.

Standardizing Acids—Employment of Borax for.—E. Reinbach.—Ber. d. Chem. Ges., xxvi, 171; Jour. Chem. Soc., 1893, 233.

Standardization of Acid and Alkaline Solutions—Comparison of Methods for the.—C. L. Parsons.—Jour. Anal. Chem., vi, 372.

Arsenous Acid in Volumetric Analysis—Extended Employment of.—R. Namias.—Abstract, Jour. Chem. Soc., 1892, 1374.

Standard Iodine Solution.—H. L. Payne describes a method for its preparation.—Jour. Anal. and App. Chem., vi, No. 9.

Volhard's Rhodanin Titration Method.—R. Henriques in Chem. Zeits., 1892, 1597.

Potassium Hydrogen Tartrate in Volumetric Analysis.—A Bornträger now points out that this salt may be conveniently used to prepaie normal alkali without the use of a normal acid.—Zeitschr. f. angew. Chem., 1892, 294.

Volumetric Solutions—Stability of.—B. Grützner in Archiv. der Pharm., 1892, 321.

Potassium Permanganate Solution.—A solution (1 : 1,000) exposed to diffused daylight was found to have suffered no decomposition in the course of a year; at the end of eighteen months' exposure a loss of 2.61 per cent. was observed. The solution kept in black bottles lost in eighteen months only 0.94 per cent. The solution (3 : 1,000) was found to possess still greater stability; kept in black bottles or exposed in colorless bottles to diffused daylight no change in the strength could be detected after eighteen months.

Sodium Thiosulphate Solution.—The $\frac{1}{10}$ normal solution at the end of six months was found unchanged when kept in black bottles or exposed to diffused daylight; it seems, however, that the former is the more permanent method of keeping, since the solution in colorless glass developed a mould growth at the end of four months.

Oxalic Acid Solution.—The $\frac{1}{10}$ normal solution protected from light and dust was not altered in the course of five months; at the end of a year a loss of 2.85 per cent. was noticed.

Indicators of Neutrality used in Volumetric Analysis by Pharmaceutical Chemists and Others.—Abstracts from various sources, but chiefly from two lectures delivered in England by Allen and Cripps.—Pharm. Review, 1892, 173.

Indicator in Alkalimetry.—W. Bolton uses a concentrated solution of flowers of sulphur in an alkaline sulphide.—Zeitschr. f. Angew. Chem., 1891, 342.

Sensitive Litmus Solution.—Lüttke. Extract 100 Gms. commercial litmus three or four times with warm water. Evaporate the extract to about 200 C.c. Acidify with 20 to 25 per cent. HCl, and dialyze through parchment paper until all HCl is removed. The remaining solution is exceedingly sensitive. Precipitate with alcohol and dry, or spread on glass plates and dry in a current of CO_2.—Apoth. Zeit., 1891, 643. (See also Centralb. f. Bact.).

Litmus—A Substitute for.—G. Ludewig. Bull. Pharm., 1892, 667. A tincture made by macerating 1 oz. of the root of Perezia microcephalia, Gray, with 10 ozs. of diluted alcohol for several days, expressing, filtering and adding sufficient menstruum to make 10 ounces, has a deep red color —almost like old port wine. One drop of dilute sulphuric acid (U. S. Ph.), added to about one-half test-tube full of tincture, will discolor the latter to light yellow; ammonia water restores the original color. Even in large dilutions the change is very noticeable; five drops of a one-fifth per cent. sulphuric acid produce entire discoloration if added to 10 minims of the above tincture diluted with 500 C.c. of water; this test would show that $\frac{1}{100}$ minim of sulphuric acid can be detected. By neutralizing with ammonia (10 drops of ammonia water to 500 of water) the original color is restored. Unsized paper saturated with the tincture and after drying exposed to ammonia vapors and to hydrochloric acid vapors showed splendid results.

Azolitmin Paper.—Dietal. Digest 50 grams of litmus for 12 hours with 1 litre of water. Decant and repeat the operation with a second litre of water. Mix the united filtrates with 100 grams of sand, add HCl until all CO_2 is expelled. Evaporate to dryness, and heat to expel the HCl. Grind the residue to powder, and wash well, first with hot, then with cold water, until the filtrate is no longer colored. Dry finally between blotting paper. To prepare the paper, treat 10 grams of the azolitmin sand with 100 grams hot water and 15 grams NH_4Cl. Allow to stand for some time, filter, and soak pieces of filter paper in the solution. On drying spontaneously a red violet color is obtained, which is sensitive to either acids or alkalies.—Pharm. Zeit., xxxvii, 7.

Volumetric Method for the Quantitative Estimation of Metals and Alkaloids.—Vitali replaces the metal with H_2S, and titrates the free acid with $\frac{1}{10}$ normal NaOH.—Pharm. Post, 1893, 297; from Boll. farmac., 1893, No. 8.

Volumetric Estimations and Analytical Separations by Means of Potassium Ferrocyanide and Ferricyanide.—By. C. Luckow. The author prepares a potassium ferricyanide free from sulphates and chlorides, which may be used in acid solutions even in presence of ferric oxide, and does not produce a precipitate in presence of mercuric, lead, manganous, uranic and stannic salts. These different properties of the two double iron cyanides render it possible to estimate some metals volumetrically in presence of one another, or to estimate them gravimetrically, as most ferricyanides may be readily filitered off.

The ferricyanide solution should give no coloration with a uranium solution, and no precipitate with a lead salt. If it should do so, it must be mixed with a little chlorine-water, and the salt recrystallized.

When titrating with ferrocyanide or ferricyanide, it is not possible to add

the indicator directly to the liquid under examination, but use must be made of test papers.—Am. Jour. Pharm., 1892, 577–579; Jour. Chem. Soc., 1892, 1129; Chem. Zeit., 15, 1491.

Coloring Matter in Fluids--The "Pharmaceut" Recommends a Method for the Detection of.—Pharm. Record., 1893, 254.

Fehling's Solution—Improvement on the Preparation of.—By Gerrard (Pharm. Conference, British); Pharm. Rund., 1892, 226.

——— The stability of this reagent has been assured, according to Rossel, by substitution of glycerin, free from acrolein, for tartaric acid, and the following formula has been suggested by him: 34.56 grams of pure cupric sulphate are dissolved in distilled water and after the addition of 150.0 grams of glycerin, and 130.0 grams of caustic potash, the volume of the solution is made up to 1000 C.c.—One C.c. of this solution corresponds to five milligrams of glucose.—Pharm. Zeit.; Meyer Bros.' Drug., 1893, 119.

Acida.

Acids—Affinity Coefficients of.—E. Lellman and Schliemann.—Ann. der Chem., 270, 204–235.

Normal Acids—Gravimetric Standardization of.—This depends upon adding to a definite volume of the acid an excess of ammonia water and evaporating to dryness; in determining hydrochloric acid the residue, NH_4Cl, is dried at 100° C. to constant weight; multiply by 0.68224 for weight of HCl; with sulphuric acid the dry residue $(NH_4)_2SO_4$ is finally heated for one-half hour to 120° C.; multiply by 0.742 for weight of H_2SO_4; with oxalic acid the residue, $(NH_4)C_2O_4$, is dried at 100–105° C.; multiply by 1.016 for weight of oxalic acid. This method gives perfectly accurate results if a pure ammonia, which should leave no residue upon evaporation, is used.—H. Eckenroth, Pharm. Ztg., 1892, 317; Am. Jour. Pharm., 1892, 375.

Acid Mineral Substance—The Existence of—Not yet Determined.—P. de Mondesir.—Compt. rend., Aug., 1892. Abstract, Chem. News, 1892, 149.

Acid Boric.—F. Lascar. Preparation in concentrated solution, with remarks on its antiseptic value.—Pharm. Record, 1892, 383.

——— Estimation of.—Good results may be obtained by Stolba's method of fixing boric acid in solution by adding a known excess of borax and igniting the residue; but O. Hehner suggests another process, as he has found that spirting often occurs during the ignition with consequent loss, unless the greatest caution be exercised. The method is to add a known weight of sodium pyrophosphate, and with this excellent results have been obtained.—Drug. Circ., 1892, 200.

——— A concentrated solution of boric acid is prepared by Mr. Puaux

(Jour. Pharm. Chim., Feb., 1892,) by using boric acid 200 Gm., magnesium carbonate 35 Gm., and water, 1000 C.c. The solution has the specific gravity 1.088, is acid to test paper, and contains one-sixth of its weight of boric acid. (See also Amer. Jour. of Pharm., 1892, p. 99.)—Am. Jour. Pharm., 1892, 365.

Boric Acid in Beer.—J. Brand concludes that boric acid should be regarded as a normal constituent in beer. The source is in hops.—Phar. Jour. Trans., 1893, 610 ;from Zeits. für das Ges. Braw., 1892, 427.

Hydrobromic Acid—Preparation of.—E. Léger gives the following two processes in Jour. de Pharm. et de Chim. (Feb., 1893, 188) :

Introduce KBr into a retort and heat on a water-bath until the salt has attained a temperature of 100° ; then add sulphuric acid drop by drop, which causes the hydrobromic gas to become disengaged. However, a small portion of bromine and of sulphurous acid is also liberated. The gaseous mixture is purified by being passed over a saturated aqueous solution of HBr, containing an excess of bromine. In contact with this solution, the acid S_2O_4 becomes oxidized according to the equation :

$$S_2O_4 + 2Br + 2H_2O_2 = S_2O_8H_2 + 2HBr.$$

Then the mixture is passed over a saturated aqueous solution of HBr, to which amorphous phosphorus has been added, when it loses all the bromine and is perfectly pure. The gas is dissolved in a distilled aqueous solution of HBr. The acid is nearly colorless and contains no trace of $S_2O_8H_2$.

The second mode of preparation of gaseous HBr, is by the action of S_2O_4 on Br, in presence of a saturated solution of HBr. The S_2O_4 is passed into a mixture of equal volumes of Br and saturated solution of HBr, when an abundant and regular disengagement of HBr, will be obtained, which can be freed of Br and the small quantity of S_2O_4, by passing over the purifying solutions previously mentioned. $S_2O_8H_2$ forms at the same time with HBr, and if in sufficient quantity the liquid will separate into two layers.

Sulphuretted Hydrogen Apparatus—Arrangement for Closing.—H. Frey.—Zeitschr. f. anal. Chem., 1892, 667.

Hydrogen Sulphide Apparatus with a Number of Taps.—H. Löndahl.—Chem. Zeit., 1892, 1690.

H_2S Water—Preservation of.—A. Schreider recommends that it be kept in black glass bottles, the stoppers of which are thickly smeared with soft paraffin.—Pharm. Central. ; Chem. News, 1703, 36 ; Pharm. Jour. and Trans., 1892, 84.

———.—Salazar and Newman. The solution of H_2S, when made in pure water or in Lepage's mixture (water and glycerin), preserves the

strength the less it is exposed to the action of the air. For the preservation of the solution it is highly advantageous to dissolve the H_2S in Lepage's mixture and not in water. Light has little influence on the speed of oxidation. The oxidation is, however, more rapid in light than in darkness. Certain organic substances added in small proportions to aqueous solutions of H_2S, modify the progress of oxidation, either by acceleration or retardation.—Chem. News, 1893, 120.

Hydrogen Sulphide—Action of, upon the Organism.—By an elaborate investigation it is established that the inhalation of 0.07 per cent. to 0.08 per cent. H_2S in the atmosphere produces in man, in the course of a few hours, very dangerous symptoms; the presence of 0.1 to 0.15 per cent. causing death quite rapidly. The odor of H_2S, if present to the extent of 0.02 to 0.03 per cent. is not as powerful and unpleasant as if present in smaller quantity. 0.015 per cent. H_2S in the air can be inhaled for some hours without detriment; but more than 0.02 per cent. produces injurious effects. The system cannot be made to tolerate this gas; on the contrary, it becomes more sensitive upon repeated inhalations.—K. B. Lehmann (Arch. f. Hygien.), Apotheker Ztg., Repert., 1892, 108; Am. Jour. Pharm., 1893, 70.

Hydrochloric Acid—Valuation of Volumetric.—Chas. Caspari, Jr., finds that the gravimetric valuation can be made as accurately with ammonia in the case of hydrochloric acid as with sulphuric acid (Proc., 1892, 859) and even with less trouble.—Pharm. Review, 1892, 136.

Sp. Gr. of Hydrochloric Acids at Different Concentrations—New Determinations of the.—Lunge and Marchlewski give a very complete set of tables.—Zeit. angew. Chem.; Zeitschr. f. anal. Chem., xxx, Part 6.

Hydrochloric Acid in the Gastric Juices—Estimation of.—S. Mizerski and L. Nencki, in a critical review of the various methods employed for this purpose, consider the colorimetric methods without value in clinical examinations. They have found the chlorometric method of Hayens and Winter (see American Journal of Pharmacy, 1892, p. 241,) the most satisfactory, since it permits the estimation of chlorine in all its chemical combinations, even when only a small quantity of the gastric juice is operated upon.—Gaz. Lekarska, through Rev. intern. de bibliog. méd., 1893, 100; Am. Jour. Pharm., 1893, 228.

Hydrocyanic Acid—Vortman's Test for.—H. Bowden has applied the test for the acid with great success, and describes a number of his experiments in detail. When cyanides are in question he prefers to liberate the acid before testing. He considers that the extreme delicacy of the test, conjoined with the great difficulty experienced in detecting hydrocyanic acid in bodies long after death, should induce toxicologists to give it a trial.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 232.

——— *Detection of.*—Soura Lopez (Rev. dos curs. de Med. do Rio de Janeiro, through Jour. de Pharm. et de Chim., June, 1893, p. 550) publishes the following process, based upon the reaction of mercuric cyanide with solution of ammonium chloride. Milk of lime in excess is added to the suspected material and heated to 100° C. on the water-bath. The lime decomposes the ammoniacal salts, disengaging all the ammonia: after the cessation of the alkaline fumes, the hot solution is filtered and introduced into a retort with an excess of pure bicarbonate of sodium; heated to 60° the sodium salt decomposes the alkali cyanides, liberating hydrocyanic acid, but does not attack potassium ferrocyanide, which is decomposed by carbonic acid slowly after several hours, with the gradual evolution of hydrocyanic acid. If the mercuric cyanide is combined with potassium ferrocyanide, sodium sulphide is placed in the retort, this acting upon the mercuric cyanide by double decomposition, in producing mercuric sulphide and sodium cyanide; then sodium bicarbonate will liberate hydrocyanic acid, acting upon the sodium cyanide. If the distilled product is added to silver nitrate solution, containing hydrocyanic acid in the form of silver cyanide, traces of the acid will remain unnoticed, since the silver nitrate solution dissolves a little of the cyanide; the author therefore uses ammoniacal silver nitrate, taking care however not to have the ammonia in excess. For determining the cyanide as Prussian blue, dissolve the silver cyanide in solution of sodium hyposulphite, add ferrous sulphate and then an excess of potassa; agitate the solution without excluding the air, and add a slight excess of hydrochloric acid. The Prussian blue must be separated at once by filtration, to prevent the formation of silver sulphate, and to obtain a sensitive end reaction.

——— *Antidote for.*—Kobert has proven experimentally that hydrogen peroxide is an antidote for hydrocyanic acid poisoning. It is to be given both by the mouth and hypodermically until all symptoms subside, and the odor of the acid can no longer be recognized in the exhalations.—Pharm. Record, 1892, 253.

Molybdic Acid as a Color Reagent for Certain Aromatic Oxy-Compounds.—Hager some time ago indicated a reaction for the tannic acid of galls and other tannic acids, according to which these substances give fine reddish-yellow colors with ammonium molybdate. J. Stahl has found that the same reactions occur for certain compounds approximating to tannin, pyrogallol, pyrogallo-carbonic acid and gallic acid. As all four substances named, contain oxy-groups in an ortho-position to each other, the reagent was tried also for other aromatic compounds in which the same case occurs. The result was that ammonium molybdate is a specific color reagent for all aromatic compounds which contain two or more oxy-groups standing in the ortho-position to each other.

The aqueous solution of free molybdic acid behaves exactly like am-

monium molybdate. The action of sodium tungstate is similar to that of ammonium molybdate.—Chem. News, June 24, 1892, 302; Am. Jour. Pharm., 1892, 439–441.

Nitric Acid on Metals—The Action of.—C. Montemartini. The author in a series of tables gives the gases evolved on dissolving of 1 gram of the metals cadmium, iron, nickel and cobalt, respectively, in excess of 27.5 per cent. nitric acid at a temperature of 8°, as follows:

	NH_3.	HNO_2.	N_2O.	N.	NO.	Total grams.
Cadmium	0.00197	0.00695	0.00570	0.00033	0.00216	0.01691
Iron	0.02493	0.00195	0.00422	0.00045	—	0.03553
Nickel	0.01874	0.00060	0.00749	0.00071	—	0.02754
Cobalt	0.02538	0.00077	0.00927	0.00467	—	0.04009

These numbers agree neither with the hypothesis that the dissolution of the metal is accompanied by the formation of nascent hydrogen, nor with that of the direct oxidation of the metal by the acid. No hydroxylamine is found amongst the final products of the reaction; this compound, if formed, must therefore be immediately destroyed by a secondary reaction. The nitric oxide is always of secondary origin, being derived in the case of cadmium, nickel and cobalt from the decomposition of nitrous acid, and in the case of iron partly from the same source and partly from the oxidation of the ferrous salts first formed. The author holds that nitric acid acts as an oxidizing agent in conjunction with the water present, the latter entering into the reaction.

The investigations were also extended to zinc. The *velocity* of the dissolution of the zinc in nitric acid increases regularly with the concentration of the acid below 25 per cent.; it then falls slightly, remains constant between 33 per cent. and 42 per cent., then diminishes regularly, attaining its minimum value at a concentration of 68 per cent.; a considerable rise then takes place, with increased concentration, but the previous maximum value is not again attained.

In conclusion, the author points out that the hypotheses that the reduction of nitric acid is effected by the direct action of zinc or by nascent hydrogen, both fail in certain cases, as a larger quantity of reduction products is formed than would be theoretically possible, and suggests that the water present enters into the reaction.—Jour. Chem. Soc., 1892, 1278; Gaz., 22, 1, 250.

——— C. Montemartini, as a result of his investigations with nitric acid on tin, antimony, molybdenum, copper, lead, bismuth, aluminum, mercury, silver, magnesium and manganese, classes the metals in three groups according to their behavior with nitric acid. To the first group

belong those metals which, with nitric acid yield only nitrous acid, nitric oxide, nitrogen trioxide, and nitric peroxide. Metals of the second group give, besides these products, hyponitrous acid, nitrous oxide, nitrogen and ammonia. In addition to these, metals of the third group liberate hydrogen. It is to be noted that metals belonging to the first group either do not decompose water at all, or only at very high temperatures. Metals of the second group decompose water at much lower temperatures, and those of the third group act on water either at ordinary or at comparatively low temperatures. There is hence a relation between the products of the action of nitric acid on metals and the behavior of the metals towards water; this relation supports the author's view that water sometimes takes part in the reaction.

The author considers that the reaction between nitric acid and metals which do not decompose water may be represented by the equation

$$M + 3HNO_3 = M(NO_3)_2 + HNO_2 + H_2O,$$
$$\text{or } M + 4HNO_3 = M(NO_3)_2 + 2NO_2 + 2H_2O,$$

according as the acid used is dilute or concentrated. To explain the formation of nitrogen trioxide, the following equation is employed: $2M + 6HNO_3 = 2M(NO_3)_2 + N_2O_3 + 3H_2O$. When water plays a part in the reaction, a more complex series of equations is necessary.—Am. Jour. Pharm., 1892, 94; Gazetta, 22, 384, 397 and 426; Jour. Chem. Soc., 1892, 1402.

——— P. C. Freer and G. O. Higley.—Am. Chem. Jour., 1893, 71.

Hydrates of Nitric Acid—Isolation of Two Predicted.—S. U. Pickering. Jour. Chem. Soc., 1893, 436. S. U. Pickering, in an extensive series of determinations of freezing points of solutions which he has been carrying on for some time, has discovered a considerable number of hydrates. At a meeting of the London Chemical Society he had announced the isolation and identification of no less than fourteen hydrates of alkylamines, with freezing points ranging from $+5°$ C. to $-71°$ C. Most of these had been predicted, owing to the presence of "breaks" in the curves representing the freezing points. At a later meeting he reported that in examining various percentage solutions of nitric acid in the same manner two distinct "breaks" were found, which enabled him to predict and subsequently prove to be due to two hydrates of the acid. The first hydrate separated out of a 20 per cent. solution of nitric acid at $-30°$ C., and had the formula $HNO_3.3H_2O$. The other was obtained at $-50°$ C. in an 80 per cent. solution of acid, and was represented by $HNO_3.H_2O$. These bodies had nothing to do with the so-called cryohydrates.

Nitric Acid—Manufacture of.—C. W. Volney.—Jour. Amer. Chem. Soc., 1892, 246.

——— Origin of the Various Colors of.—L. Marchlewski.—Chem. News, 1892, 271.

Nitric Acid—Estimation by Cinchonamine Salts.—Gammarelli.—Gazz., xxii., 635; Jour. Chem. Soc., 1893, 297.

——— *Gasometric Estimation of.*—Glaser.—Zeitschr. f. Anal. Chem., xxxi, 285.

——— *Reduction by Copper.*—Freer and Higley.—Amer. Chem. Jour., xv, 71.

Basic Nitrates—Decomposition of, by Water.—Rousseau and Tite.—Compt. rend., cxv, 174.

Nitrous and Nitric Acids.—Veley (Chem. News, lxvi, 175), in making experiments as to the conditions of formation and decomposition of HNO_2, finds that the oxidation of HNO_2 by permanganate is very slow toward the end of the operation, so that to get a satisfactory determination, a slight excess of permanganate is added, the solution allowed to stand 30 minutes, and the excess of permanganate determined by KI and standard $Na_2S_2O_3$. By determining the total acidity in another portion, the data for estimation of both HNO_2 and HNO_3 were obtained.

Pure Phosphoric Acid.—Preparation of, from Sodium Phosphate, and by the Phosphorus-Nitric Acid Method.—Watson.—Jour. Soc. Chem. Ind., xi, 224.

Phosphoric Acid.—Table for calculating amount of P_2O_5 when weight of $Mg_2P_2O_7$ is known, from 0.5 Gm. of substance.—X. F. Scheiding.—Chem. Zeit., 1892, 1145.

Phosphoric Acid—A New Method for the Quantitative Estimation of.—A. Kwisda.—Zeits. Oest. Apoth. Ver., 1893, 393.

Phosphoric Acid and Moisture.—From Official Methods of Analysis of the Assoc. of Official Agric. Chem. for 1890–91.—Chem. News, 1892, 107.

Phosphoric Acid—Volumetric Determination of.—Spica (Gazz. chim. ital., 1892, 117, through Rép. de Pharm., 1892, 316) estimates the phosphoric acid by means of ferric phosphate, which is precipitated completely in neutral solution. The reagent is a solution of iron-ammonia alum, and is regulated so that 1 C.c. = .001 Gm. P_2O_5 being titrated preferably with a solution of phosphate of ammonium, 2.9439 Gm. to a litre. After obtaining the phosphates in solution (iron, aluminum and manganese being eliminated), it is exactly neutralized with a caustic alkali, using phenolphthalein as indicator; to this solution is added a small quantity of salicylic acid, and the above reagent is used for titration. Toward the end of the operation it is best to allow the precipitate to settle, so as to observe with better advantage the end of the reaction, which is indicated by a violet coloration.—Am. Jour. Pharm., 1892, 572.

——— *Uranium, Titration of.*—Coleman and Granger, in Jour. Soc. Chem. Ind., xi, 328. For standardizing it is found that (1) the uranium solution must be standardized by means of calcium phosphate; (2) the

percentage value of calcium phosphate used for standardization must be estimated gravimetrically.

Titration of Pyro- and Meta- Phosphates.—Von Knorre (Zts. ang. Chem., 1892, 639) finds that methyl orange is neutral to $Na_2H_2P_2O_7$. Phenolphthalein shows the alkaline color with $Na_4P_2O_7$, but acid with $Na_2H_2P_2O_7$. With $Ca_2P_2O_7$, however, it is neutral, so that by adding $CaCl_2$ and titrating with $Ca(OH)_2$ solution, neutrality is attained with phenolphthalein as indicator, when the solution contains $Ca_2P_2O_7$.

Attempts looking to the determination of metaphosphate in presence of pyrophosphate were unsuccessful.—S. of M. Quart., 1893, 165.

Metaphosphates.—Contribution to our knowledge, by G. Tamman.—Jour. f. Prakt. Chem., xlv; Chem. News, 1892, 329.

Amidophosphoric Acid.—H. N. Stokes.—Am. Chem. Jour., 1893, 198.

Acid Sulphuric—The Constitution of.—A. R. L. Dohme.—Pharm. Review, 1893, 21 and 45.

Sulphuric Acid—Formation of by Burning of Illuminating Gas.—Lieben, in Apoth. Zeit., 1892, 448.—Pharm. Rund., 1892, 262.

——— *Fuming.*—This may be produced (Rev. Scient.) by submitting ordinary concentrated sulphuric acid to the action of an electric current of a certain strength, the electrodes being either of platinum or charcoal. Under the influence of the current a certain amount of hydrogen and oxygen is formed; that is to say, the water of the concentrated sulphuric acid is decomposed by the electric current, the oxygen going off at one pole and the hydrogen at the other; at the same time a certain amount of anhydrous sulphuric acid is formed, and after a certain interval the product has the composition and properties of Nordhausen acid. The electrodes are kept at a distance of 2 or 3 millimeters apart by means of plugs of asbestos. The current employed is set down as 0.1 ampère for every cubic-centimeter of electrode.—West. Drug., 1892, 300.

Aromatic Sulphuric Acid.—W. J. Smythe examined four samples with the following results:

No.	Sp. Gr. at 15° C.	Percentage of Com. Alcohol.
I.	0.953	78.
II.	0.982	72.3
III.	1.007	62.7
IV.	0.937	76.4

The odors of the distillates from samples I., II. and III. were very similar, while that from IV. had a very decided odor of benzoic aldehyde, so distinct as to almost conceal the odor of cinnamon. This odor was so unusual that the author has decided to fully investigate the matter and determine if possible whether the odor was the result of decomposition or

due to contamination only. The results of this investigation I hope to produce in the near future.—Meyer Bro's. Drug., 1892, 397.

Fluosulphonic Acid.—Thorpe and Kurman have isolated this acid, the formula of which is $SO_2(OH)F$ and gave an account of their experiments at the opening meeting for the session of the Chemical Society.—Proc. Chem. Soc., 115, 160.

Freezing Points of Sulphuric Acid of Different Concentrations, and the Sulphuric Acid contained in the Solid and Liquid Portions.—J. Thilo gives tables of his results.—Chem. Zeit., xvi, 1688.

Free Sulphuric Acid—Rapid Determination of.—Cazeneuve and Nicolle (in Jour. Pharm. Chim.; Nat. Drug., 1892, 25) publish a new and rapid method for the determination of the presence of free sulphuric acid in carbonated or aërated waters. These waters often contain free sulphuric acid carried over mechanically from the generator. The amount is usually above 0.25 Gm. per liter, but occasionally is as much as double this. The process recommended by the author for its rapid detection and approximate estimation depends upon the fact that calcium carbonate is precipitated when aërated waters are added to lime water, and dissolves in excess of the former, being reprecipitated on heating, and that should the aërated water contain a trace of free sulphuric acid this precipitate of calcium carbonate does not form, being converted into calcium sulphate, which remains in solution. The reagent used is lime water saturated at the ordinary temperature and free from any trace of alkali. One liter of water dissolves 1.29 Gm. of CaO at 15° C., 1 C.c. of the solution, therefore, corresponding to 0.0022 Gm. of sulphuric acid. One C.c. of the lime water is placed in each of the five test tubes, and then 4 C.c., 8 C.c., 12 ccm., 16 C.c., and 20 C.c. of the aërated water to be tested added respectively. Should a turbidity appear in all the tubes on heating, the quantity of free sulphuric acid is negligibly small. Should, however, for example, the contents of the third tube remain clear, while the second becomes turbid, the quantity of sulphuric acid necessary to neutralize 1 ccm. of lime water is contained in something between 8 and 12 C.c. of the aërated water. The precise volume requisite can then be found by repeating the process with 9, 10 and 11 C.c. of the aërated water. An obvious calculation gives the content of sulphuric acid per liter.

Sulphuric Acid—Gravimetric Estimation.—Weinig. An accurately measured quantity of acid is introduced into a weighed platinum dish and mixed with a very small excess of ammonia. The solution is evaporated to dryness and the residue is finally dried for half an hour at 115–120°. After cooling in a desiccator the whole is weighed.—Zeitschr. f. angew. Chem., 1892, 204.

——— Ripper treats the precipitate of $BaSO_4$ with Br water. Br removed by heating solution upon a water bath. Treated with HCl. The

precipitate washed, ignited.—Zeit. f. anorg. Chem., ii, 36; Jour. Chem. Soc., 1893, 239.

Sulphates—Volumetric Estimation of.—C. Cherix, in Pharm. Centralhalle, describes the following method for the estimation of the sulphuric radical in alkali sulphates by precipitation with barium hydrate: To the neutral solution of the alkali sulphate, baryta water is added until complete precipitation of the sulphuric acid is effected. The solution is then heated to the boiling point, and the excess of baryta is removed by passing a stream of washed carbonic acid gas through it.

The solution which is freed in this manner from the precipitated barium sulphate and carbonate contains the original sulphate equivalent of alkali carbonate, and can be easily estimated with an acid volumetric solution. It is made neutral or slightly acid, and titrated with $\frac{n}{10}$ sulphuric acid volumetric solution; methyl-orange is used as an indicator. This method gives results which compare well with the gravimetric method.

——— A. Bouriez uses a standard solution of barium hydrogen phosphate. From the amount of phosphoric acid found (by Joly's method) the amount of sulphuric acid may be calculated.—Chem. Centralb., 1892, 570.

——— Stolle recently proposed a method similar to that of Andrews. Precipitation by use of a standard solution of $BaCrO_4$ in HCl, neutralizing with ammonia, which precipitates the excess of $BaCrO_4$, leaving H_2CrO_4 in the solution corresponding in amount to the $BaSO_4$ precipitated. By Andrews' method this H_2CrO_4 was determined by titration with standard $Na_2S_2O_3$, by Stolle's method with standard ferrous solution. Von Asboth (Chem. Zeit., xvi, 922) finds it defective, since it is impossible to keep for any length of time a solution of $BaCrO_4$ in HCl without gradual evolation of Cl resulting from reaction of the chromate upon the HCl.—Chem. News, 1892, 168.

——— H. Quantin.—Bull. Soc. Chim. de Paris; Zeitschr. f. anal. Chem., 1892, xxx, Part 6.

Sulphuric Acid in Sulphates.—Volumetric Estimation of.—E. Stolle. A weighed quantity of the substance is dissolved in a 500 C.c. flask and the solution of barium chromate is added, best from a burette, until the sulphuric acid seems completely precipitated. After adding a slight excess of ammonia, the whole is made up to the mark, filtered, and the chromic acid estimated in an aliquot part of the liquid by means of ferrous sulphate in the usual manner.—Zeitschr. f. angew. Chem., 1892, 234.

Sulphurous Acid—Decomposition of, by Charcoal.—Berthelot has shown that at a red heat the reaction of the two bodies results in the production of carbonic oxide, carbon oxysulphide and carbon disulphide. Scheurer-Kestner (Compt. rend., cxiv., 296), ascertained that at a white heat the reaction proceeds according to the equation $2\,SO_2 + 3\,C = 2\,CO + CO_2 + 2\,S$.—Am. Jour. Pharm., 1892, 466.

——— *Test Paper for.*—Two Gm. wheat starch are made into a thin paste with 100 C.c. boiling water and a solution of 0.2 Gm. potassium iodate in 5 C.c. water added; a good quality of filtering paper is impregnated with this solution, allowed to dry, cut into small strips, and carefully preserved in glass-stoppered bottles. This paper when moistened will indicate very minute quantities of free sulphurous acid by the appearance of a blue color (the sulphurous acid liberates iodine from the iodate, and this in turn reacts upon the starch, producing blue iodide of starch). Sulphites will also yield the blue color if the paper be first moistened with a diluted hydrochloric acid (1 : 100); the hydrochloric acid itself has no action upon the paper, being used to liberate small quantities of the sulphurous acid.—Südd. Apotheker Ztg., 1892, 219; Am. Jour. Pharm., 1892, 463.

Aluminum.

Aluminum—Properties of.—A. E. Hunt.—Pharm. Era, 1892, 327; from Jour. of Franklin Ins.

Aluminum—Experiments with.—M. Balland finds that air, water, wine, beer, cider, coffee, milk, oil, butter and dripping, as well as urine, saliva, etc., have less action upon aluminum than upon any of the metals in ordinary use. Vinegar and sea-salt attack it, but not to such an extent as to prohibit its employment.—Pharm. Jour. and Trans., 1892, 81; Jour. de Pharm. et de Chem. (5), xxvi, 49.

Aluminum Vessels.—Researches upon the employment of aluminum in the construction of eating, drinking and cooking vessels.—W. Ohlmüller.—Arb. a. d. k. Gsudhteamte, Berlin, 1892, 377.

——— *Action of on Beer.*—R. Kobert.—Pharm. Centralh., 1892, 399: from Chem. Zeit., 1892, 821.

Aluminum Acetico-Tartaricum.—Athenstädt and Redeker describe its preparation.—Pharm. Zeit., 1892, 339; Pharm. Centralh., 1892, 430.

Aluminum Sulphate.—R. Grüner found iodine.—Zeits. Oest. Apoth. Ver., 1892, 429.

Ammonia.

Ammonia—Determination of, by Distillation.—F. Stolba.—Chem. Zeit. (Rep.), 1893, 111.

Liquid Ammonia.—An article on the composition of the trade article and how to manufacture liquid ammonia of really 99.995 per cent. by H. von Strombeck.—Jour. Franklin Ins.: abstract, Chem. and Drug., 1892, 650.

Producing Ammonia—Novel Method of.—The copper-colored nitride of titanium heated in hydrogen gas yields ammonia; the nitride is reproduced by heating it in nitrogen, so that by alternately heating this nitride in hydrogen gas and in nitrogen a continuous supply of ammonia can be

obtained. The nitride of titanium is found as an accidental product in the bottom of the blast furnaces of Staffordshire, England, and eleswhere. Its composition was made out by Wöhler.—Nat. Drug., 1892, 143.

Ammonia—Alcoholic Solution of.—Delépine.—Abstract, Jour. Chem. Soc., 1892, 1049.

Carbonic Acid—Detection of in Ammonia.—J. Hertkorn proposes that a mixture of ammonia and lime water should show only a slight turbidity on boiling.—Chem. Zeit., 1892, 15, 1493.

Nessler Test for Ammonia.—L. de Konnick has recently found that in ammoniacal solutions the Nessler test does not produce the usual yellowish-brown precipitate in presence of alcohol, nor even a coloration. It is just possible that many other substances, especially those of an organic nature, may act like alcohol, or may act just the reverse, *i. e.*, show the color where no ammonia is present.—Amer. Drug., 1893, 386.

Ammonium.

Ammonium—Sulpho-Ichthyolicum.—Ullman gives results of the employment of this salt.—Pharm. Post, 1893, 323.

Hydrogen Ammonium Sulphate.—Action of on glass. Lachaud and Lepierre.—Bull. Soc. Chim., viii, 603; Jour. Chem. Soc., 1893, 280.

Arsenic.

Arsenic—Chemical Examination of a Human Stomach for.—Report by C. O. Curtman.—Meyer Bros.' Drug., 1893, 31.

——— *Combustion of Powdered.*—Hirschsohn, in Pharm. Zeitsch. f. Russl.; Drug. Circ., 1892, 35.

Can Arsenic be Quantitatively Volatilized as Arsenic Hydride?—F. W. Schmidt.—Chem. News, 1892, 71, 83. The author quotes Fresenius's condemnation of gravimetric processes founded on the volatility of AsH_3 or SbH_3. His investigations indicate that when As is present as arsenide in the substance tested (in a Marsh apparatus), it escapes entirely as AsH_3, but when in some oxidized combination, such is not the case. It may, however, be completely driven over as AsH_3 by adding an HCl solution of $SnCl_2$ after the evolution of gas became sluggish.

Determination of Arsenic.—Backstrom (Fres. Zts. Anal. Chem., xxxi, 663). The sulphide, separated by any approved method, is converted by HNO_3 into As_2O_5 and the H_2SO_4 expelled by careful heating at a temperature below red heat. With a little practice the intensity of the heat may be kept within the proper limits; the As_2O_5 is then cooled and weighed.

Detection, etc., of Arsenic.—Thiele (Liebig's Annalen, cclxv, p. 55) reports with regard to this subject. Hypophosphorous acid precipitates the element without boiling in a solution strongly acidified with HCl. The addition of KI facilitates the reaction.

In the Marsh apparatus metallic iron may be used to precipitate Sb, allowing the As to escape as AsH_3. The iron, however, must be free from sulphide, or the As will not all be evolved.

The use of platinized zinc in the Marsh apparatus diminishes the delicacy of the test. A rapid current of H_2S precipitates As_2S_3 from a warm acidified solution of H_3AsO_4. A slower stream gives a mixture of As_2S_3, As_2S_5 and S. The same thing occurs in the cold if the solution is strongly acidified with HCl, also when the gas is diluted but passed in a rapid current through a warm acidified solution. The reduction to H_3AsO_3 by concentrated acid as described by Mayrhofer was not found to occur. A description is given of the method for obtaining and determining all the As in a substance, evolving it as AsH_3.—School of Mines Quart., 1893, 160.

Arsenious Acid for Volumetric Analysis.—Namias (Gaz. Chim. Ital., xxii, 508), prepares a solution by heating 8 Gm. As_2O_3 with 80 Gm. $NH_4C_2H_3O_2$ in 300 to 400 C.c. of water, finally cooling and diluting to one liter. NH_4Cl solutions dissolve As_2O_3, but deposit it partially by standing. The acetate solution can be used in examination of bleaching powder, of chlorates, of commercial MnO_2, chromates, etc.—School of Mines Quart., 1892, 158.

Volumetric Assay for Arsenic Acid.—Franceschi (L'Orosi, xv, 192) uses a standardized solution of Fe_2Cl_6 with KCNS as indicator. The arsenic acid solution must be neutral, and free from acetate or phosphate. Insoluble arsenates must be decomposed with Na_2CO_3 and the solution neutralized with HCl before titrating. If phosphates are present, the arsenic must be separated as sulphide, and converted to arsenate. Conversely, ferric salts may be titrated with alkaline arsenate, the end reaction being marked by decolorization of ferric sulphocyanate in the solution.

Rapid Precipitation of As_2S_3.—Neher (Zts. f. Anal. Chem., xxxii, 45) finds that precipitation is rapid in strong HCl solution (containing at least two volumes conc. HCl to one vol. of water). A rapid stream of H_2S must be passed for about 1½ hours. Care is necessary to avoid heating the solution, either before or during the passage of the gas. After filtering, the precipitate should be finally washed with hot alcohol to remove the traces of sulphur which may accompany it.

Arsenous and Antimonous Oxides.—A. Baumann (Zts. f. angew. Chem., 1892, 117). These oxides reduce potassium ferricyanide in alkaline solution. Hence a known amount of that reagent before and after reaction with either As_2O_3 or Sb_2O_3 evolves different amounts of O when treated with H_2O_2. The difference in the amount of O obtained serves as the measure of the amount of As_2O_3 or Sb_2O_3 present: 1 C.c. oxygen 4.425 Mgms., As_2O_3 or 6.4573 Mgms. Sb_2O_3.

Arsenic—Spontaneous Combustion of.—Recently powdered metallic

arsenic which, in the process of powdering, had been moistened with water to prevent dusting, is recorded by E. Hirschsohn as capable of spontaneous combustion. A quantity of powdered arsenic in a double paper bag had been received late in the evening, and set aside over night in a basket containing other articles packed in straw and sawdust. The next morning, upon opening the store, the peculiar garlic-like odor attracted attention to the basket containing the powdered arsenic; an examination disclosed that the arsenic had agglutinated to a solid, glowing mass; that the paper containers had been charred, and that a portion of the straw was scorched; a number of bottles in the basket had also burst, owing to the high heat, and upon the charred paper bag were sublimed some beautiful crystals of arsenious oxide. A fire, which probably would have been attributed to some other cause, was in this case averted.—Pharm. Ztschr. f. Russl., 1892, 612; Am. Jour. Pharm., 1892, 614.

Arsenic as a Prophylactic.—C. F. Bryan has been advancing evidence to support the claims of arsenic as being a prophylactic in scarlet fever, diphtheria and influenza. It was given in the form of pills containing $\frac{1}{10}$ grain of arsenous acid, or in 2 minim doses of Liquor Arsenicalis.—Phar. Jour. Trans., 1893, 443; from Brit. Med. Jour., 1665, 1187.

Arsenic Test—Fleitmann's Test.—John Clark.—Jour. Chem. Soc., 1893, 884.

——— *Improvement on Reinsch's.*—Ibid., 886.

Reinsch's Process—Improved.—J. Clark identifies the arsenic or antimony, coating the copper in Reinsch's process, by digesting the metal in a cold mixture of caustic potash and hydrogen peroxide. The arsenic and antimony are thus dissolved, and the former is converted into potassium arsenate. Copper oxide is filtered off, arsenic distilled and determined.—Proc. Chem. Soc., 124, 129.

Poisoning by AsH_3.—Death of Prof. H. O. Schulze by this gas.—Chem. News, 1893, 37.

Arsenates—Crystalline.—C. Lefèvre.—Ann. Chim. Phys., 27, 5; Jour. Chem. Soc., 1893, 273.

Arsenic—Cyanide of.—By E. Guenez. The author has succeeded in preparing $As(CN)_3$. It is a slightly yellow, crystalline, deliquescent powder. A mixture of potassium chlorate and arsenic cyanide detonates with violence when struck with a hammer.—Compt. rend., cxiv, 1186; Phar. Jour. and Trans., 1892, 2.

Arsenous Iodide.—D. B. Dott. Commercial specimens are met with which contain a large proportion of insoluble matter, uncombined arsenum and arsenous oxide. The author, however, has confined himself to those samples which come fairly within B. P. requirements.

(1) 1.866 gram treated with warm water, insoluble matter collected on filter and well washed, gave 0.24 gram = 1.28 per cent. insoluble.

.700 gram dissolved in water with excess of nitric acid gave 1.077 gram AgI, = .582 gram Iodine, = 83.15 per cent.

83.55 required for AsI_3.

(2) The same salt recrystallized from water and dried by exposure to the air. .408 gram gave .180 AgI, = .097 Iodine = 23.84 per cent.

.535 gram gave .444 As_2S_3, = .2707 Arsenic = 50.59 per cent.

(3) 1.469 gram treated with water, as in No. 1, left .009 gram insoluble = .61 per cent.; and the solution gave 2.134 grams AgI = 1.153 Iodine = 78.51 per cent. The di-iodide, AsI_2, requires 77.20.

(4) 2.8 grams arsenous oxide were dissolved in 64 C.c. hydriodic acid (11 per cent.), and solution evaporated to dryness with heat of a water-bath. .891 gram gave 1.199 AgI = .648 iodine = 72.73 per cent.

These results prove that it is practicable to prepare a salt of composition nearly agreeing with the formula AsI_3, but that the tendency is towards a deficiency of iodine, that treatment with water produces extensive decomposition with separation of a very basic salt, and that the alternative method referred to in the Pharmacopœia does not yield a salt of the composition required. We may perhaps infer that this is an instance in which it would be better for the Pharmacopœia not to refer to the methods of preparation, but rather to content itself with giving sufficient tests for purity.—Pharm. Jour. Trans., Jan. 28, 1893, 619.

Molybdoarsenates.—C. Friedheim.—Zeit. anorg. Chem., ii, 314; Jour. Chem. Soc., 1893, 282.

Arsenic Trioxid—A Study of Some of its Forms.—I. Sickels.—Research, Loomis Lab., Univ. City of New York, 1892, 2, 121.

Barium.

Barium Chloride, according to Dr. Lelli, exerts a harmful influence upon certain forms of scrofula; but the gastritis of scrofulous children is generally modified after a few days, the diarrhœa diminishes, and a cure is effected in from two to four weeks; at first the remedy has an irritating effect upon the mucous membrane of the intestines. The author prescribed the salt to children, according to their age, in doses of 0.03 to 0.20 Gm., to be taken after a meal.—La Médecine moderne; Am. Jour. Pharm., 1892, 606.

Barium Hypophosphite.—George Coull examined two samples of this salt quantitatively and qualitatively. He obtained the following results:

	I.	II.
Ba	45.71	39.06
$(H_2PO_2)_2$	50.16	52.92
H_2O	1.20	1.18
	97.07	93.16
Ca (indirectly)	2.09	4.88
	99.16	98.04

It also contains chlorine. It seems desirable that the Formulary Committee order the anhydrous salt to be used.—Chem. and Drug., 1892, 323.

Bismuth.

Bismuth—Purification of.—E. Matthey.—Chem. and Drug., 1893, 489.

Bismuth—Action upon, by Hydrochloric Acid.—Ditte and Metzner.—Jour. Pharm. Chim., 1893, 205.

Bismuth Benzoate has been prepared by Vigier (Le Progrès Méd.) by double decomposition between bismuth nitrate and sodium benzoate. It contains 27 per cent. of benzoic acid, and has been recommended as an intestinal antiseptic.

Decomposition of Bismuth Subnitrate by water.—On heating this bismuth salt $(Bi_2O_3)_2N_2O_5$, with water to 200° C. for about 90 hours, G. Rousseau and G. Tite (Compt. rend., cxv, 174) obtained the oxide Bi_2O_3 in crystalline condition.

Bismuth Subnitrate in infantile Diarrhœa.—Dr. Zinnès (Rev. Thérapeut. 1892, 501) uses the following prescriptions in cases of greenish infantile diarrhœa where the stool contains numerous pieces of casein and where it is attended with more or less violent abdominal pains. Fennel water 75.00; bismuth subnitrate, 3.00; lime water, 6.00; syrup of bitter orange, 15.00. Give a teaspoonful every two hours. In cases which resist this treatment the author uses the following: An infusion of columbo, 0.5 or 1 Gm. to 75 Gm. water; subnitrate of bismuth, 3 Gm; syrup of bitter orange, 15 Gm. Give one or two teaspoonfuls every two hours.—Am. Jour. Pharm., 1893, 14.

Bismuth Sub-Gallate as a Microbicide.—By Colosanti (in La Ref. Med.) Cultures of various micro-organisms in broth, mixed with iodoform and aristol, were still alive and growing after eight or nine days; while similar cultures, to which the bismuth salt had been added, seemed to have lost their power of multiplying on the fourth or fifth day. As a medicine it produces no toxic symptoms.—Merck's Bull., May, 1892, 278; Phar. Jour. and Trans., 1892, 3.

Bismuth Salicylate.—G. Vulpius in Pharm. Centralh., 1893, 189.

Commercial Bismuth Salicylate.—The variable composition is seen from the analyses of six brands, made by Dr. F. Goldmann. The moisture and free salicylic acid varied between 0.11 and 5.07 per cent., and the bismuth oxide between 57.84 and 72.34 per cent. Two of the salts contained 11.93 and 20.20 per cent., respectively, of bismuth subnitrate. The recommendation is made that future Pharmacopœias give processes for making the salt so as to insure a more uniform product.—Pharm. Ztg., 1892, 797.

Boron.

Boron—Amorphous.—H. Moissan. A summary of the properties of pure boron. Boric acid, heated with magnesium powder, on subsequent treatment with acids, leaves amorphous boron. It is a more powerful reducing agent than either silicon or carbon, and on the whole is most nearly allied to the latter element. Boron combines more readily with the non-metals than with the metals. It acts very energetically upon the metallic fluorides; less so upon the chlorides. Metallic oxides are more readily reduced by boron than by carbon. The acids react energetically with boron; the hydracids with greater difficulty. The alkali metals have no action on boron, but magnesium, iron, aluminium, silver and platinum at higher temperatures combine with it quite readily. Notwithstanding its great affinity for oxygen, boron may be immersed in fused potassium nitrate without any reaction occurring, provided that the temperature is below that at which oxygen is disengaged. Fused potassium nitrite is decomposed with great violence. Sodium and potassium carbonates are reduced, while calcium and barium carbonates are not.—Jour. Chem. Soc., 1892, 1153; Compt. rend., 114, 617.

Calcium.

Calcium and Magnesium Salts—Function of.—By O. Loew. One main purpose of lime salts in the vegetable economy is to remove oxalic acid. One of the useful properties of magnesium salts is the formation of magnesium phosphate facilitating the formation of nuclein, plastin and lecithin.—Phar. Jour. and Trans., 1892, 83; Flora, 1892, 368.

Calcium Bisulphite.—This salt is, according to the clinical observations of Nils Sjoberg (Eira, through Rev. intern. de bibliog. méd., April, 1893, p. 137), such a reliable antiseptic that the irritation caused by it is an insignificant objection. However, it cannot be used in surgical operations, because it attacks the instruments used, but it can always find appropriate application as an antiseptic in virulent wounds, ulcers, etc.—Am. Jour. Pharm., 1893, 282.

——— This salt is recommended by Henry Berg (Eira, Stockholm, xvi, through Rev. internat. de bibl. méd., 1892, p. 222,) as a valuable antiseptic, which does not possess toxic properties, destroys infectious germs quickly and surely, is not caustic, does not alter the healthy tissues, and is prepared without difficulty and at a low cost in colorless solution, having a characteristic and easily recognized odor.—Am. Jour. Pharm., 1892, 467. (See Merck's Ber., Jan., 1893.)

Calcium Carbonate.—Fusion of. Le Chatelier and Joannis, in two papers.—Compt. rend., cxv, 817 and 934, 1009 and 1296.

Calcium Carbonate—Fusing Point of.—H. Le Chatelier has repeated J. Hall's experiments.—Phar. Jour. Trans., 1893, 609; Compt. rend., 115, 1009.

Calcium Fluoride in Bones.—Carnot found this constituent to vary from 0.20 per cent. to 0.63. According to Gabriel the current statement of the percentage of calcium fluoride in teeth is still more erroneous than that for bones. He finds sufficient evidence to suggest a new element being present.—Pharm. Jour. Trans., 1893, 610; from Zeits. f. anal. Chem.

Calcium Tartrate—Determination of.—Ch. Ordonneau. The author gives two methods for the determination of calcium tartrate in Bull. Soc. Chim., Paris, series 3, 9–10, 68; reprinted in Chem. News, March 10, 1893.

Calcium tartromalate has been isolated by C. Ordonneau (Bull. Soc. Chim., 3 ser. vi, 261), from the juice of green grapes, and from wine prepared from grapes attacked by mildew. It is a double salt of left rotating calcium tartrate and right rotating calcium malate, of the formula $CaC_4H_4O_6,CaC_4H_4O_5+CH_2O$, and on being treated with sufficient sulphuric acid, yields tartromalic acid, in deliquescent crystals. Some white wines were found to contain a considerable amount of malic acid; this acid gradually disappears in the grapes as they ripen.—Am. Jour. Pharm., 1892, 365.

Calcium Salts for Therapeutic Use.—According to G. Sée (Méd. mod., March, 1892, p. 137,) the calcium preparations usually employed in medicine are uncertain in their action because they are absorbed only in minute quantities, a small proportion being eliminated through the kidneys, while nearly the entire quantity passes through the intestines, and is rejected without having produced any action. Calcium iodide and calcium bromide are the salts particularly adapted for introducing iodine and bromine into the organism, the proportion of these elements being greater than in any other medicinal salt. On the other hand these calcium salts have neither the frequently unpleasant activity of the corresponding potassium salts nor the inertia of the sodium salts. Calcium chloride and bromide are adapted for use in a large number of dyspepsias and stomachal lesions. Calcium iodide, given in small doses, does not in the least derange the digestive organs; otherwise it agrees with the potassium salt in the favorable action upon the respiration, the heart, and upon specific diseases.—Am. Jour. Pharm., 1892, 365.

Calcium Salts in Syrup and Sugar Products.—Estimation of. J. Wolf. —Abstract in Jour. Chem. Soc., 1892, 1377.

Chlorinated Lime—Constitution.—It is maintained by J. Mijers (Rev. des Trav. Chim. des Pays Bas): (1) That chlorinated lime is not identical with the bleaching agent which Lunge obtained by conducting a current of anhydrous sub-chlorous acid (Cl_2O) over hydrated chloride of calcium; (2) that the composition of chlorinated lime is represented by the formula $Cl_2Ca(OH)_2$—*i. e.*, it is a combination of chlorine with calcium hydroxide—while Lunge's bleaching combination is expressed by

$CaOCl_2$; (3) that it is impossible, except at very low temperatures, to produce a chlorinated lime from which free lime shall be entirely absent.—Drug. Circ., 1893, 35.

Neutral Bleaching Fluid.—Herisen and Lefart. A perfectly neutral bleaching fluid may be obtained by rubbing up a given quantity of chlorinated lime with water, then dissolving a quantity of sodium sulphate equal in weight to the lime taken, and mixing the two liquids. After precipitation the clear liquid is used, and is said to give better results than the chlorinated lime alone.—Färber Ztg.: Pharm. Review, 1893, 9.

Carbon.

Carbon—Examination of Different Forms.—Wiesner.—Abstract, in Jour. Chem. Soc., 1892, 1273.

Bivalent Carbon.—J. U. Nef.—Ann. der. Chem., 270, 267.

Carbon—Preparation of, under High Pressure.—H. Moissan.—Compt. rend., cxvi, 218.

Diamonds—Reproduction of.—C. Friedel.—Ibid, 224.

Diamonds—Artificial.—Moissan has demonstrated that this substance is produced under great pressure and at high temperatures.—Compt. rend., Feb., 1893; Rép. de Pharm., 1893, 105.

——— *Studies on the Properties and Preparation of.*—Compt. rend., 116, Nos. 6, 7, 10 and 12; Am. Chem. Jour., 1893, 375.

Carbon.—A historical article upon carbon.—V. Cornish.—Knowledge: West. Drug., 1892, 417.

Carbon as Related to Chemical Education.—R. G. Eccles, in Drug. Circ., 1893, 52.

Carbon Black.—Oil, Paint and Drug. Rep.; Drug. Circ., 1893, 40.

Carbon Tetrachloride as a Solvent.—Eckenroth recommends it as being especially adapted as a solvent for extracting fat from food materials and other articles, since it is not inflammable.—Pharm. Zeitung, 1892, 338; Pharm. Jour. and Trans., 1892, 2.

Carbon Dioxide—The Collection and Employment of.—Amer. Drug., 1892, 95; from London Brewer's Jour.

Carbon Disulphide—To Deodorize.—Wash the CS_2 with a solution of mercuric chloride, decant and filter.—Pharm. Review, 1893, 18.

——— *Production of, by Electricity.*—The following process for manufacturing carbon disulphide has been patented in France: Coke (from gas-works) or any other similar carbonaceous body, is heated to redness by a variable number of voltaic arc burners, and sulphur vapors are conducted over it. The vapors are generated in the same apparatus from sulphur,

sulphur earths, pyrites or sulphates (gypsum, barium sulphate) or the waste of soda manufactories. The sulphur is first set free from its combination and then volatilized by heat produced by the electric action.—Drug. Circ., 1893, 83.

Carbonic Anhydride—Supersaturated Aqueous Solutions of.—L. Pratesi has observed that certain mineral springs contain a larger quantity of carbonic anhydride in solution than is indicated by Bunsen's observations. For example, a mineral water from Contursi, in Salerno, issues at a temperature of 40°, and contains 1.7605 Gm. of free carbonic anhydride per liter. Ordinary seltzer water, when drawn from the siphon, and allowed to remain in the air for half an hour, still contains 1.901 liters of carbonic anhydride at 8° and 764.75 mm. pressure. Distilled water, when saturated with carbonic anhydride in a siphon under pressure, and then drawn off and allowed to remain for half an hour, was found to contain 1.858 liters of the gas at 9.5° and 770.65 mm. pressure per liter. It would hence seem that water first saturated with carbonic anhydride under pressure, and then left for a short time under the ordinary pressure, contains a much larger quantity of carbonic anhydride than water simply saturated with the gas under ordinary pressure.—Gaz., xxii, 493.

Asbolin, a preparation obtained by Braconnot from the aqueous infusion of soot, and which has been used to some extent as a remedial agent in phthisis, has been examined by Béhal and Desvignes (Compt. rend., cxiv, 1541) and found to be a mixture of *pyrocatechin* and *homopyrocatechin*. The former melts at 104° and boils at 240° C., and the latter at 51° and 251° C. respectively. This is identical with the homopyrocatechin from creosol, which was formerly known only as a syrupy liquid, but was prepared by the authors in the solid state.

Animal Charcoal.—By J. Hodgkins. The author shows that it is impossible to prepare animal charcoal so that the pharmacopœial requirements may be met, and that were this hypothetical preparation of the B. P. in existence, it would be useless as well as costly. The best method which he found to make a good purified animal charcoal is as follows: Boil the charcoal for some hours with twice its weight of hydrochloric acid and twice its weight of water. Wash free from acid and soluble salts; dry, etc., as usual. The following is the result of his analyses of animal charcoal prepared by him according to the different pharmacopœial processes; five represent commercial samples and one was made according to the method proposed by him:

	Water.	Ash.	Carbon.	On anhydrous substance.		Percentage Composition of the Ash Obtained on Calcination.											Decolorizing power.
				Ash.	Carbon.	Fe_2O_3.	Al_2O_3.	CaO.	MgO.	SiO_2.	Cl.	SO_3.	CO_2.	P_2O_5.	F.	Total.	
Commercial bone-black ..	7.77	76.65	15.58	83.11	16.89	1.80	0.95	51.73	trace	2.86	0.59	1.21	1.41	38.86	tr.	99.41	79.95
B. P., 1885.	0.15	77.04	22.81	77.15	22.85	1.51	1.20	45.33	——	3.81	——	1.06	——	46.46	—	99.37	38.27
Codex., Paris, 1884.....	1.98	56.61	41.41	57.76	42.24	2.97	0.95	47.20	——	10.71	——	1.48	——	37.33	—	99.64	63.19
U. S. P., 6th Decen. Rev., 1883	0.84	16.09	83.07	16.12	83.88	11.88	5.62	9.33	——	59.00	——	2.14	——	11.43	—	99.40	48.05
Commercial samples of "carbo-animalis purif., B. P."																	
A	17.64	16.45	65.91	19.98	80.02	4.87	0.51	6.38	1.02	79.80	——	2.81	——	2.87	—	98.26	62.54
B.	50.44	10.00	39.56	20.18	79.82	10.21	2.73	4.68	——	73.63	——	0.66	——	7.44	—	99.35	69.88
C.	4.70	80.28	15.02	84.24	15.76	2.14	0.84	53.00	——	3.55	1.00	——	2.29	36.89	—	99.71	67.42
D.	5.19	73.57	21.24	77.59	22.41	2.02	1.07	52.67	——	4.48	0.50	1.64	1.22	36.38	tr.	99.98	66.01
E.	4.01	72.67	23.32	75.70	24.30	1.80	1.19	48.67	——	6.48	——	——	——	40.93	—	99.07	50.73
Special method, F.	7.85	13.87	78.28	15.05	84.95	5.21	1.20	22.10	——	54.81	——	3.51	——	13.11	—	99.94	86.76

Calcis phosphas, B. P., dried below 100° C.	32.65
Ditto, after ignition	1.33

NOTE.—The decolorizing power of the charcoal (without previous drying) is expressed in percentage of color removed from a standard caramel solution (=100 per cent.).

—(Brit. Pharm. Conference) ; Phar. Jour. and Trans., 1892, 192–196.

——— A historical summary of its use.—Bull. Soc. d' Encour. Indus. Nat., vii, No. 84; Chem. News, 1893, 169.

Animal Charcoal as a Decolorizer.—T. R. Carswell, as a result of many experiments, finds that carbon as such possesses no inherent power of decolorizing; that the use of animal charcoal for this purpose depends, to some extent, especially for some colors, on its physical condition as an aggregation of cellular spaces, but mainly on its mineral constituents; that a research on these lines might furnish us with a decolorizing agent, having all the advantages and free from the disadvantages of animal charcoal; and that attempts at purification are based on erroneous ideas.—Phar. Jour. Trans., 1893, 615.

Iron in Bone-Black.—Therne (J. Anal. and App. Chem., vi, 211) finds that bone-black has a tendency to remove iron from solutions rather than to give it up to them. The most of the iron can be removed by passing a magnet through the ground black spread on a sheet of paper. Results obtained in this way are always in excess of the truth, from adherence of C, etc., but the method is useful.

For the chemical determination, incineration of the black is necessary, since the organic matter of fresh black may reduce some permanganate, and be reckoned as iron.

Iron and Aluminum in Bone-Black—Their Quantitative Determination.—F. G. Wiechmann.—Science, 1893, 300 and 333.

Oxidizing and Decolorizing Action of Charcoal.—Cazeneuve (Chem. News, 1893, 152). As far back as 1874, A. W. von Hofmann observed that charcoal—especially animal charcoal—can exert a strong oxidizing action. An alcoholic solution of leukaniline quickly yields rosaniline if boiled with animal charcoal. Cazeneuve made similar observations on boiling aqueous solutions of α-naphthylamine or of paraphenylendiamine with animal charcoal; the first mentioned becomes a purple red, and the second a brown. The charcoal retains the color firmly, but yields it up again to boiling alcohol. The idea that the oxidizing action of carbon was concerned in the decolorizing action was at once suggested. On experiments made for this purpose, it was found that charcoal which had been previously ignited and cooled in a current of dry nitrogen or in carbon dioxide, had less coloring power than such as has been cooled in the air. Cazeneuve is of the opinion that the residual oxygen in the charcoal burns the coloring matter.

Cerium.

Cerium Salts—Photographic Properties of.—M. M. Auguste and Louis Lumière. The easy reductibility of ceric salts has led the authors to study the action of light upon these substances, and they have been able to observe that this action effects a rapid reduction which may serve as a basis for the establishment of interesting photographic procedures.

Among the mineral salts which have yielded them the best results are ceric sulphate and nitrate, obtained by dissolving ceric hydroxide in sulphuric or nitric acids. The aqueous solutions of these salts have served to saturate sheets of paper, suitably sized and coated with a thin layer of gelatin, which the cerium salt colors an intense yellow. After drying in the dark, the papers were exposed to light under a positive proof. In all the transparent parts the luminous rays reduce the ceric salt to the cerous state, and the paper is decolorized at these parts. This progressive decoloration enables him to follow the action of the light and to stop the impression at the proper moment.

The proof when thus obtained must be treated with a reagent capable of differentiating the cerous from the ceric salt, so as to accentuate and fix the image. In an analogous process with the manganic salts, which he has formerly published (Bulletin de la Soc. Française de Photographie, p. 218, 1892), he used the striking oxidizing properties of the manganic salts to form insoluble coloring matters with a great number of substances of the aromatic series. In the same manner, if he treats the proofs with cerium salts with these reagents, he forms and fixes coloring matters at the points where the ceric salt has not been reduced by the light. It then suffices to eliminate, by washing, the excess of the reagent as well as the cerous salt to obtain a proof distinctly fixed. It is important that the coloring substance produced should be insoluble, so that it may not be carried away by washing.

He found, on considering their photographic utilization, and on comparing the action of the ferric, cobaltic, manganic and ceric salts upon a great number of substances of the aromatic series, that the ceric salts are capable of yielding colored reactions much more numerous than the salts of the other metals.

Among the most characteric reactions he mentions the following:

In an acid solution the proofs are gray with phenol, green with aniline salts, blue with naphthylamine *a*, brown with amido-benzoic acid, red with parasulphanilic acid, green with the salts of orthotoluidine, etc. On treatment with ammonia the color changes; it becomes, for instance, violet with aniline, red with methylamine, etc.

Photographic papers prepared with cerium salts possess a much greater sensitiveness than that of the preparations with ferric or manganic salts.—Comptes rendus, cxvi, p. 574; Chem. News, April 21, 1893, 188.

Cerium Salts.—Pure salts for scientific purposes are prepared by Schottlaender (Berichte) on the principle that the ammonio-ceric nitrate crystallizes with great facility, thus permitting its separation from the allied rare earths.—West. Drug., 1892, 383.

Chlorine.

Chlorine Researches—Mond's.—Editorial, Chem. and Drug., 1892, 647. Also, Ibid., 690.

Estimation of Chlorine in Electrolyzed Solutions.—L. M. Norton.—Chem. News, 1892, 115; from Techn. Quart., iv, No. 4.

Copper.

Atomic Weight of Copper.—Thos. W. Richards, from two series of investigations, concludes that the atomic weight should be somewhat higher than the figure accepted at the present time, and finds it to be 63.604 (O = 16) or 63.44 (O = 15.96).—(Ztschr. anorgan. Chem.) Chem. Ztg. (Repert.,) 1892, 165.

Copper—Estimation of, by Volhard's Thiocyanate Method.—R. Heweigues.—Chem. Zeit., 1892, 1597.

Cupric Salts—A Reaction of.—E. Lenoble.—Bull. Soc. Chim. Phys., ix and x, No. 5; Abstract, Chem. News, 1893, 158.

Copper Hydroxide—Dehydration of, and certain of its Basic Compounds in the Presence of Water.—Spring and Lucion.—Zeitschr. f. anorg. Chem.. ii, 195; Jour. Chem. Soc., 1893, 210.

Copper Oxalate and Cuprammonium Oxalate.—Seubert and Rauter.—Ber. d. Chem. Ges., xxv, 2821.

Copper Phosphate.—This salt is used by Saint-Germain for hypodermic injections in the treatment of tuberculosis. Dr. Lutton employed copper salts for this purpose (see Amer. Jour. Pharm., 1887, p. 559), but the method fell into disuse. The author employs the following formulas:

(1) Crystallized sodium phosphate, 5 Gm., distilled water and glycerin, of each 30 Gm.

(2) Copper acetate, 1 Gm.; distilled water and glycerin, of each, 20 Gm.

The two solutions are mixed without filtering the mixture. An injection of this, in its immediate effect, presents analogous action to an injection of Koch's liquid.—Rev. de Thér., 1893, 50; Am. Jour. Pharm., 1893, 130.

Basic Sulphates of Copper—New Formation of.—Marchlewski and Sachs.—Zeit. anorg. Chem., i, 405; Jour. Chem. Soc., 1893, 169.

Copper Sulphates—Effects of, in Soils.—At the New York Agricultural Experiment Station, seeds of plants representing widely differing natural orders were planted in soils containing 5 per cent. and 2 per cent. of copper sulphate, respectively. Similar seeds were planted in ordinary soil as a check. As a result it was found that more seeds germinated in almost every case in soils containing copper, but the average length of time required for germination was greater in these. The foliage was of a deeper green color. The leaves were smaller and the yield of fruit much less than in the case of normally grown specimens. The roots were small and ill-developed. It was conclusively proved that the salt used could be taken up by the roots.—Nature, xlvi, 422; Phar. Jour. and Trans., 1892, 264.

Copper Sulphate in Iron Sulphate—Detection of.—According to Vandenput (Journ. de Pharm. d' Anvers; Monit. de Pharm., 1892, 1107) copper cannot be detected in sulphate of iron by means of ammonia, except when present in rather large proportion. When present in small quantities the ammonia does not form the blue copper solution. In the latter case the author dissolves the precipitate in nitric acid and places in the solution a bright piece of iron, on which the copper when present is deposited.—Am. Jour. Pharm., 1892, 572.

Fluorine.

Fluorine.—H. Moissan describes his methods of obtaining the element and its properties in Annales d. Chim. et Phys.; West. Drug., 1892, 378.

Fluorides of Zinc and Cadmium.—C. Poulenc.—Phar. Jour. Trans., 1893, 806; from Compt. rend., 116, 581.

Fluorine—Fossil Wood Containing.—T. L. Phipson.—Compt. rend., Oct. 3, 1892.

Fluorides and Yeast.—Dr. Bækeland has found yeasts can be kept for more than six months, with an addition of $\frac{1}{2000}$ to $\frac{1}{3000}$ part of fluoride, and even after that time, they may develop rapidly and produce a splendid fermentation.—Jour. Amer. Chem. Soc., 14, 219.

Fluoroxymolybdates: The non-existence of Cuprous Fluoride. Mawes. —Abstract, Jour. Chem. Soc., 1893, 124.

Fluorine in the Ashes of Plants—Ost describes a method by which, after separation of the Fl as $CaFl_2$ mixed with some impurities, the amount of Fl is determined by the amount of material removed by the HFl therein from a weighed amount of glass. For a full account of the process the original paper should be consulted.—Ber. d. Chem. Ges., xxxvi, 151.

Gold.

Gold Cure—Historical Notes on the.—H. C. Bolton.—Pop. Sci. Month.: West. Drug., 1892, 374-376.

Gold—Therapeutics of.—J. Strahan observes that the prolonged use of gold salts gives rise to "auric fever," marked by profuse sweats, great increase of urine and saliva, The chloride of gold and sodium is the favorite salt at present; dose from $\frac{1}{30}$ to $\frac{1}{12}$ of a grain, usually in a pill.—West. Drug., 1892, 337; Brit. Med. Jour.

Gold: Its Therapeutics and Pharmacology.—W. P. Carles.—Bull. Soc. Pharm. Bordeaux; trans. in Nat. Drug., 1893, 196.

Gold Bromide—Preparation of.—C. Patrouillard uses the following process: Trichloride of gold, 1 Gm.; potassium bromide, 1 Gm.; diluted pure sulphuric acid (1 : 10), 4.50 Gm., and distilled water, q. s. On warming this mixture, it shows a very dark rose color, due to the produc-

tion of gold bromide. At a slightly elevated temperature, the reaction is complete in a few moments. Allow the solution to cool and agitate several times with about 10 ccm. of ether; when the aqueous solution will be nearly entirely decolorized.

Agitate the mixed ethereal solutions with a little pure basic calcium chloride; decant carefully and evaporate the ether. Dehydration is necessary in order to obtain the final product pure. If any water was still retained by the ether, desiccate at an elevated temperature, when a portion of the bromide is decomposed. By evaporating on a heated tile, the ethereal solution does not rise to the edge of the container, and the loss is avoided which is always experienced by heating on a water-bath.—Soc. Pharm. de l'Eure, 1892; Am. Jour. Pharm., 1893, 77.

Gold and Sodium Chloride is recommended by Boubila as a remedy in progressive general paralysis, augmenting the chances of resistance and retarding further development during the period of decline. It is given morning and evening in doses of 2 milligrams in a potion of 120 Gm.; after fifteen days the dose is increased by 2 mgm., until 1 centigram is reached, which is continued for a fortnight. The treatment is then discontinued for a month, after which time it is resumed in the same manner. Under the conditions named these large doses are borne without inconvenience.—Rev. Internat. de Bibl. Méd., July 25, 1892; Am. Jour. Pharm., 1892, 466.

Gold Chloride for Snake Poisoning.—Calmette, director of the Bacteriological Institute at Taïgon, Cochin China, reports in the Archives de Medicine Navale, on the result of fifty-two experiments with the venom of the cobra di capello on rabbits, guinea-pigs, rats, fowls, pigeons, dogs and monkeys. The British Medical Journal for April 23 contains the following summary:

(1) It is possible to cure animals suffering from the effects of snake poison by neutralizing the venom that has been absorbed by the blood with subcutaneous injections of gold. (2) None of the chemical agents hitherto recommended for the purpose (ammonia, iodine, nitrate of silver, etc.) can have any curative action, inasmuch as they can neither destroy the poison introduced into the wound nor neutralize that which has found its way into the circulation. A partial exception must be made in favor of permanganate of potassium, which has the power of destroying the poison in the wound, though it has no effect after it has been absorbed. Calmette thinks his results are applicable in the case of man as well as in that of animals.

The first thing to be done after a bite has been inflicted is to stop the flow of blood through the veins as far as possible with an elastic ligature. From eight to ten cubic centimeters of a 1-per-cent. solution of chloride of gold should then be injected with a sterilized hypodermic syringe into the wound itself and under the skin around it; but not more than one

cubic centimeter of the solution should be injected at any one spot, in order to avoid too intense a caustic action on the tissues. Similar injections must also be given at the level of the ligature and between it and the heart. The injections may be given in any part of the body, either into the connective tissue or into the substance of the muscles. They cause neither eschar nor abscess if the solution of gold is titrated at 1 per cent. at the outside, carefully sterilized, and kept in a yellow or black glass bottle, so as to avoid the risk of decomposition under the influence of the sun's rays. The ligature may be taken off as soon as the injections have been given.—West. Drug., 1892, 427.

An Alloy Resembling Gold.—It consists of copper and antimony in the proportion of about 100 to 6. It is prepared by adding the desired quantity of antimony to the copper melted and heated to a certain temperature. After the antimony is melted and intimately mixed with the copper, a little charcoal, magnesium, and calc-spar is added to the crucible. This flux has the effect of causing the disappearance of a porous structure which the material would not lose without that, and of furnishing a very compact cast metal. The latter can then be rolled, beaten, hammer-hardened, and soldered, like gold, and, after being polished, it has the aspect of genuine gold, while its solidity is much greater than that of the latter.

This alloy might be substituted for gold, not only because of its color, but also by reason of certain properties that it possesses. It remains unalterable, without any modification of its color, even after having been exposed for a long time to air containing ammoniacal or acid vapors. It can be rolled and worked like gold, and has the aspect of this metal without containing the least particle of it. This new alloy is also much less costly than those that are usually employed in place of the precious metals. —Nat. Drug., 1892, 146.

Hydrogen.

Hydrogen—Mercuric Chloride in Evolution of.—H. Borntraeger states (Pharm. Central.) that the violent development of hydrogen by zinc and hydrochloric acid, can be checked by simply placing in the generator one or two drops of a 10 per cent. sublimate solution.—Drug. Circ., 1892, 180.

Hydrogen Peroxide.

Hydrogen Peroxide—Detection of.—Griggi (L'Orosi, 1892, 295). The rapid disappearance of the blue color of the ethereal extract of an aqueous solution of chromic anhydride and hydrogen peroxide may be avoided by substituting amyl alcohol for the ether. On shaking the solution of chromic anhydride and hydrogen peroxide with an equal volume of amyl alcohol, the latter acquires a magnificent indigo color, which retains its original intensity for six hours at 24°.—Jour. Chem. Soc., 1893, 233.

Hydrogen Peroxide—A Rapid Assay of.—F. X. Moerk. The method of assay depends upon the following reaction and data: $5\ H_2O_2 + K_2Mn_2O_8 + 3\ H_2SO_4 = 5\ (O_2) + 8\ H_2O + K_2SO_4 + 2\ MnSO_4$; as one-half of the liberated oxygen comes from the $K_2M_2O_8$, one molecule of the latter (molecular weight 314) will liberate five atoms of oxygen (weighing 80), coming from the H_2O_2, so that 62.8 grams $K_2Mn_2O_8$ will liberate 16 grams oxygen which, at 0° C. will occupy 11.16 liters or at 20° C. (an average temperature) almost 12 litres or 12,000 cubic centimetres; 1 C.c. oxygen at 20° C. therefore is liberated by the use of 0.00525 Gm. $K_2Mn_2O_8$. 2.625 Gm. $K_2Mn_2O_8$, dissolved in sufficient distilled water to make a liter of solution, will liberate, under proper conditions, 500 C.c. oxygen from H_2O_2, so that 1 C.c. of this solution represents 0.5 C.c. oxygen.

The assay must be carried out in presence of a large excess of water, as follows:

To 500 C.c. water (river water will answer) in a capsule add 5 C.c. dilute sulphuric acid and sufficient permanganate solution to give a pink tint (this counteracts any reducing action which the river water may have on the permanganate solution); now add 5 C.c. of the hydrogen peroxide and then (from a bottle or graduate containing 175 C.c.) allow the permanganate solution to run in a thin stream, stirring constantly until the pink color is no longer discharged; the pink color after a short time is replaced by a brownish color or precipitate (MnO_2H_2O) due to the action of manganous sulphate upon the slight excess of permanganate; measure the permanganate solution remaining in the bottle or graduate and divide the permanganate used by 10, the result will be the volume of oxygen liberated by one volume H_2O_2.—Am. Jour. Pharm., 1893, 65.

——— *Estimation of the Strength of Solutions of.*—P. Nehrbas.—Pharm. Record, 1893, 229 and 250.

Hydrogen Peroxide—A Comparison of Some Medicinal Brands of.—R. L. Lloyd examined the following brands: Bené, Peuchot, Marchand and Oakland Chemical Company. The volume of oxygen was estimated by F. X. Moerk's method. In the results for volume, that sample which was examined, after being opened, is marked with the small letter (*a*). The following results claim to be comparisons:

	Specific Gravity.	Volume of Oxygen.	Volume of Oxygen after having been opened at least 24 hours.	Acidity. Milligrams of KOH for 10 C.c.	Residue in 50 C.c. Milligrams.	Sulphuric acid or Sulphate.	Other metals.	Other matter.
O. C.....	1.0119	*a*13.5—12.0	*a*13.0	6.45	30.0	trace	Sodium	present
Marchand....	1.0116	13.5—*a*10.4	10.3—*a*10 0	25.16	50.6	present	Sodium	boric acid
Béné.	1.0110	10.5—*a*9.8	*a*9.45	6.83	60.0	present	Sodium Potassium	none
Peuchot No. 2.	1.0120	11.76	—	7.20	150.0	trace	Calcium Sodium Potassium (trace)	glycerin
Peuchot No. 1.	1.0136	12.5—*a*6.1	*a*4.05	9.85	320.0	present	Sodium	present

All the samples contained HCl or chloride, and phosphoric acid or phosphate (Béné merely a trace); but were free from barium, except P. No. 1, which contained a trace.

In the residue from Marchand's solution no chloride could be found; the solution, however, evidently contained hydrochloric acid, which must have been driven off during evaporation, the excess of sulphuric acid preventing the formation of chlorides.

The residues from Peuchot's and O. C.'s solutions were not again entirely soluble in water, alcohol, ammonia or cold hydrochloric acid. In Peuchot No. 2 this insoluble matter was calcium phosphate.—Am. Jour. Pharm., 1893, 276.

Hydrogen and Barium Peroxides—Estimation of.—A. Baumann. From 2 to 5 C.c. of the hydrogen peroxide is mixed in the author's apparatus with 10 C.c. of a saturated solution of potassium ferricyanide, and afterwards with 5 C.c. of aqueous potash or soda. 1 C.c. of liberated oxygen equals 1.51862 milligrams of H_2O_2.—Zeitschr. f. angew. Chem., 1892, 116; Jour. Chem. Soc., 1893, 86.

Hydrogen Dioxide as it is Dispensed.—H. E. Smith and H. Oertel.—N. Y. Med. Jour., 1892, 147. An examination of fifty commercial samples purchased in New York and other American cities, revealed the fact that 56 per cent. gave from 7 to 9 volumes of oxygen, or 2 to 2.5 grams in 100; 36 per cent. contained less than 2 grams, and 8 per cent. were entirely deficient in peroxide. All the samples were, of course, acid. A good reaction for hydrochloric acid was shown in 33 samples and sulphuric acid in 12 samples, while traces were present in all. Boric acid was found in 18 cases. The result of the examination leads to the conclusion that the commercial solution is very unreliable in strength, and that a sample yielding 8 or 9 volumes of oxygen may be considered as well up to the commercial standard.

Note on Solutions of Hydrogen Dioxide.—E. R. Squibb.—Ibid., 149. The author examined nine samples of so-styled 15-volume solution, and found that only one reached two-thirds of this, and two were less than half-strength. He remarks on the instability of strong solutions, and recommends one yielding 10 volumes as convenient, fairly stable, and more nearly in accordance with that which is ordinarily sold. The presence of acid prevents decomposition, but a little answers as well as a large quantity—a single drop of sulphuric or hydrochloric acid being sufficient for a bottle containing about 16 ounces of solution. The purer the solution the less liable it is to decomposition. A fairly pure solution, when kept for many days in an open vessel, even at summer temperature, will get stronger instead of weaker, as the water evaporates more rapidly than does the peroxide.

The correct standardizing test is made by dissolving 2.832 grams of permanganate in distilled water, and bringing the volume to 500 C.c. Ten C.c. of the solution of peroxide are diluted with water to 100 C.c., and then ten C.c. of this dilution are measured off for the test. A few drops of sulphuric acid should be added, and the permanganate solution run in from a burette, with constant stirring, until a drop fails to be completely decolorized. The number of C.c. of permanganate solution used indicates, directly, the number of volumes of available oxygen in the solution tested.

Hydrogen Peroxide Solutions—Purification of Commercial.—Talbot and Moody, in Jour. anal. and app. Chem., suggest the following as a method for purification of the commercial solutions: Treat the solution with about ten per cent. by volume of alcohol, after which barium hydrate is added to distinctly alkaline reaction. The precipitate containing much of the impurities is then filtered off with a gentle suction, using a porcelain filter plate, and the excess of barium removed by the addition of sulphuric acid in excess. After settlement of barium sulphate, the liquid is quickly filtered as before. The alcohol may be removed at reduced pressure, and the residual solution is sufficiently pure for analytical purposes.—Notes on New Rem., 1893, 143.

Peroxides of the Alkali Metals—Commercial Preparation of.—Am. Chem. Jour., 1893, 378; from Monit. Sc. Quesneville (4), 6, 869.

Hydrogen Peroxide and Benzoyl Peroxide—The Molecular Weight of.—W. R. Orndorff and J. White.—Am. Chem. Jour., 1893, 347.

Iodine.

Iodine.—Prof. Meineke found that iodine will not change when exposed to the air for a few hours: after five days' exposure the loss is so slight as to come within the limits of error; under the most favorable conditions for absorbing moisture (powdered iodine kept beside a vessel containing

water under a bell-jar) it did not absorb more than 0.1 per cent.—Chemiker Ztg., 1892, 1126.

——— *Preparation of Pure.*—Meineke has improved on Musset's process and succeeded in removing any cyanogen. Instead of potassium iodide alone, he prepares a mixture of a solution of calcium chloride (sp. gr. 1.35) and a little potassium iodide with a few drops of hydrochloric acid. The iodine is then sublimed twice, the first time with the addition of a little barium oxide.—Chem. Zeit., 1892, 1219 and 1230.

——— *A Simple Method for Determining the Water in.*—By Dr. Meineke. The iodine is placed in a test-tube and at once superstratified with silver powder; the tube is closed with a glass stopper and weighed immediately. The open tube is then heated gently so that only a very slow formation of silver iodide takes place. During the formation of silver iodide, the water which escapes is condensed in the colder parts of the tube, from which, after the complete absorption of the iodine, it is expelled by a higher temperature. When this takes place, the tube is stoppered up, allowed to cool, and weighed. The difference shows the quantity of water which has been present in the iodine. The determination, with all the preparations, scarcely requires one hour.

The method allows of an accurate determination of moisture in iodine, even if chlorine and bromine are simultaneously present; it loses, however, its trustworthiness if considerable quantities of cyanogen are present.—Chemiker Zeitung; Chem. News, 1892, 144.

Iodine Trichloride.—A. Tschirch finds that in contact with water iodine trichloride immediately undergoes decomposition, yielding monochloride, hydrochloric and iodic acids. Comparative trials with pure chloride, monochloride and the brown commercial article have given identical results, and they show that the monochloride is a very powerful antiseptic, even when diluted to the extent of 1 in 2,000.—Schweiz. Wochensch. f. Chem. u. Pharm., 1892, 24, p. 229: Pharm. Jour. and Trans., 1892, 263.

——— Tavel and Tschirch have experimented upon its antiseptic properties.—Archiv. der Pharm., 1892, 331.

——— This salt is highly recommended by Dr. Pflueger, of Bern, as an antiseptic in various affections of the eye (Ann. d' Oculistique, Sept., 1892). In solutions of 1 : 2000 it kills within one minute the Staphylococcus aureus, and in from one to five minutes various cultures from pus and malignant ulcers. For subconjunctival injections the new medicament was used of the strength of 1 : 1500, and as an application in different diseases of the eye solutions containing from 0.1 to 1 per cent. were employed.—Am. Jour. Phar., 1893, 13.

Iodides of Sulphur.—Notes by E. Kremers.—Pharm. Rund., 1893, 57.

Iodotannin Compound.—H. Barnouvin, in Repert. Pharm., 1892, 350: Chem. Zeit., 1892, 266. It is prepared as follows: To a given solution

of tannin add sufficient iodine solution that after standing for two hours no reaction will be obtained with starch paste. Evaporate this solution to the consistency of syrup, then spread upon glass plates and dry in the drying closet. The shining, yellowish-brown scales thus obtained are readily soluble in water and alcohol, less so in glycerin. The watery solution is permanent.

Iodine and Cyanogen—Qualitative Examination of the Chemical Action.—C. Meincke in Zeitschr. f. anorg. Chem., 1892, 165; Chem. Zeit., 1892, 346.

Cyanide of Iodine.—Goldfarb finds that this substance, whose formula is CNI, is a virulent poison to all animals, whether hot or cold-blooded. Its toxicity, however, is notably inferior to that of hydrocyanic acid. Kobert writes that he has found the substance very valuable as a preservative of natural history specimens against the attack of insects, mice, rats, etc.—Nat Drug., 1892, 63.

Iodine in Organic Compounds.—Thoms (in Pharm. Cetralh., 1893, 11) recommends the addition of concentrated sulphuric acid, assisted by heat if necessary; the evolution of violet-colored vapors is characteristic.

Iodate in Alkali Iodides—Test for.—Dissolve 2 Gm. of the suspected iodide in 25 C.c. of boiled distilled water, shading it from too strong a light. Add a little starch, then 10 C.c. tartaric acid solution, when, if an iodate is present, a blue color will be immediately formed.—Robineau and Rollin, in Jour. de Pharm. et de Chim., Dec., 1892; Am. Jour. Pharm., 1893, 174.

Iodine and Potassium Chlorate—Note on the Interaction of.—T. E. Thorpe and G. H. Perry. The authors find that when an intimate mixture of iodine and potassium chlorate, in the proportions demanded by the following equation, is heated $3KClO_3 + I_2 = KClO_4 + KCl + KIO_3 + ICl + O_2$, not only is the yield of iodine monochloride invariably very far below the theoretical amount, but that much of what is actually formed is converted into the solid trichloride, and that free chlorine and more or less iodic anhydride are often simultaneously formed. These facts seem to show that the actual change is very imperfectly indicated by the equation above given.

Careful quantitative experiments, so arranged that the various products of the change, both fixed and volatile, could be estimated, have shown that, in reality, the primary and main reaction between iodine and potassium chlorate is a simple metathesis: $2\,KClO_3 + I_2 = 2\,KIO_3 + Cl_2$. The chlorine so liberated attacks any iodine that is not within the "sphere of action" of the heated chlorate, and forms more or less mono- and trichloride of iodine, in amounts depending upon the temperature and mode of heating. When care is taken not to heat the mixture to a higher temperature than is actually necessary to effect the above change, the saline residue contains only traces of potassium chloride and perchlorate, which

seems to indicate that these substances are not really products of the direct action, but are formed by local superheating of the chlorate, with evolution, of course, of oxygen, and consequent formation of iodine pentoxide. By careful management, it is possible to convert practically the whole of the iodine present into potassium iodate, with the liberation of the equivalent amount of gaseous chlorine.

Iodine monochloride, as is well known, is readily dissociated by heat into the trichloride and free iodine. It seemed to us interesting to determine whether a solution of iodine monochloride in chloroform or carbon tetrachloride would show any indication of such dissociation when allowed to diffuse into a quantity of the same solvent. The experiment indicated that no such dissociation occurred, but that the ratio of iodine to chlorine remained unchanged throughout the mass of the solution, a conclusion in harmony with the results of recent work by Stortenbeker.—Zeit. Physikal. Chem., 10, 183; Jour. Chem. Soc., 1892, 925.

Iodides—Elimination of.—The elimination of iodides which pass in the urine, and especially of potassium iodide, commences two or three minutes after their ingestion. In healthy individuals it is prolonged for at least thirty-six hours after administration in doses of 0.3 to 1 or 2 Gm. After large and repeated doses the elimination continues for eleven days or more. The liver contains five times more of the potassium iodide than the blood and muscles, and the urine contains ten times more than the blood.—Am. Jour. Pharm., 1893, 130.

Iron.

Reactions of Ferric Salts with Thiocyanates.—H. M. Vernon. The experiments of the author have led him to the following conclusions: That the color reactions of ferric chloride, nitrate, sulphate, tartrate, citrate and acetate with potassium, ammonium, sodium, lithium, calcium and barium thiocyanates, indicate that the formation of ferric thiocyanate in these cases is dependent on two factors, one being the nature of the acid of the ferric salt, the other the nature of the base of the thiocyanate; the former exerting an action somewhat in accord with the relative affinities of the acids, whilst the latter shows no such relationship. In all these cases, except with the acetate, the color of the ferric salt caused no inconvenience.

Heating the solutions increases the activity of the various reactions, and when those that favor the formation of ferric thiocyanate predominate, an increase of color is observed, and *vice versa*. Therefore, by heating at 20°, 30°, 40°, 50° and 60°, or when decomposition ensued at some intermediate temperature, an increase of color is observed with thiocyanates and ferric salts of monobasic acids, and a decrease with ferric salts of polybasic acids.—Chem. News, 66, 177, 191, 202 and 214; Jour. Chem. Soc., Abstr., 1893, 122; Am. Jour. Pharm., 1893, 292. (See also Krüss and Moraht, Zeitschr. f. anorg. Chem., xxx, Part 6.)

Iron Reaction with Potassium Ferrocyanide.—C. Müller.—Pharm. Centralh., 1893, 219.

Stannous Chloride Method for Iron Titrations—A Modification of.—R. W. Mahon.—Am. Chem. Jour., 1893, 360.

Titration of Iron.—Moraht. The standard solution is one of potassium ferrocyanide. The precipitate is Fe_7Cy_{18}. The indicator is KCNS. In order that the end reaction may be readily detected, ether is added, in which the ferric sulphocyanate is soluble. The operation is conducted in a flask fitted with a ground stopper; about 50 C.c. of ether are added, and the flask closed and vigorously shaken after each addition of the standard solution, until the ether becomes colorless. A preliminary rough titration, followed by a close titration, on separate portions of the solution, is usually necessary.—Zeitschr. f. anorg. Chem., i, 211.

Iron Preparations.—E. Kremers, in the Pharm. Rund., 1892 231, shows that the iodometric method of F. B. Power (Proc., 1892, 906) can be worked satisfactorily by persons less experienced in analytical methods. The author gives results upon the examination of Citrate of Iron, Soluble Citrate of Iron, Citrate of Iron and Quinine, Soluble Citrate of Iron and Quinine, Citrate of Iron and Strychnine, Solution of Tersulphate of Iron, Solution of Subsulphate of Iron and Solution of Nitrate of Iron.

Iron—Novel Salts of.—Lachaud and Lepierre.—Bull. Soc. Chim. de Paris, Abstract, Chem. News, 1892, 172.

Ferric Acetate with Sulphuric Acid.—T. Salzer (Pharm. Centralh., 1893, 191). On adding hydrochloric or nitric acids to a diluted solution of ferric acetate, the color changes gradually to yellow, although remaining clear. On the other hand, addition of sulphuric acid produces a precipitate of insoluble basic ferric sulphate practically free from acetate, in which for each molecule of sulphuric acid 1 to 6 molecules of ferric oxide is contained. Not all of the acetate is decomposed, but it is decomposed to a certain extent.

Ferric Chloride—Action of Water Vapor on.—Rousseau. The decomposition of ferric chloride in presence of water vapor is strictly analogous to its decomposition in concentrated solutions.—Compt. rend., cxvi, 188.

——— *Hydrates of.*—Roozeboom has made a comprehensive investigation of the hydrates of ferric chloride, studying especially the solubility curves of these hydrates in water.—Abstract, Jour. Chem. Soc., 1893, 119.

Iron—Alcoholized.—A. G. Vogeler has examined into the origin of this term, and finds it to have originated in a suppositious practice of grinding iron filings wet with alcohol, (as in powdering boric acid), or because alcohol was employed in removing the glucose with which iron filings were ground together. It has also been believed to designate a high degree of refinement, or, as put by Wm. Procter, Jr. (Am. Jour. Phar., 1867), in the

sense that ethereal is applied to volatile oils, meaning that they are highly rectified.—West. Drug., 1892, 449.

Chlorobromide of Iron.—Preparation by C. Lenormand.—Compt. rend., 116, 820; Phar. Jour. Trans., 1893, 888. The author has prepared this compound by acting upon proto-chloride of iron with bromine. Its formula is given as Fe_2Cl_5Br, and it occurs in the form of dark reddish-brown crystals, which are green by reflection, and completely opaque. For this reason, and because of their avidity for water, it has not been possible to determine the crystalline system to which they belong. Besides being very deliquescent, they are very soluble in water, disengaging a considerable quantity of heat during solution, and equally so in alcohol and ether. Chloroform, benzine, and toluene are other solvents of the compound, but carbon disulphide does not affect it. It is dissociated by heat, but sublimes easily when warmed in a sealed tube with an excess of bromine.

Amorphous, Hydrated Ferric Oxide; Crystalline Ferric Hydroxide; Potassium and Sodium Ferrites.—Van Bemmelen and Klobbie.—Abstract, Jour. Chem. Soc., 1893, 169.

Iron Oxide and Oxyhydrate.—Action upon Cane Sugar.—Schlactrupp and Spunt.—Pharm. Centralh., 1893, 148.

Ferro-Magnesium Sulphate.—($FeSO_4.MgSO_4 - 6\,H_2O$). A greenish white crystalline powder, slightly soluble in water and very permanent. In anemia and chlorosis it is given in medium doses of 0.5 Gm. three times daily. Best given in the following mixture: ferro-magnesii sulphate, 8.0; aq. chlorof., 180. Dose, one teaspoonful (= 0.5 Gm. of salt) three times daily.—Merck's Ber., 1893, 71.

Iron Rust Possessing Magnetic Properties.—A. Liversidge.—Chem. News, 1892, 239.

Ferrum Reductum.—An examination of commercial samples failing to find a single specimen meeting the requirements of the Pharm. Austr. (98.8 per cent. Fe) caused an inquiry to be made regarding the difficulty. It was found that if the hydrogen, generated from zinc and sulphuric acid, was not purified before acting upon the heated ferric oxide, three hours' exposure produced a preparation of grayish black color which dissolved in dilute sulphuric acid only after prolonged boiling, and was found to contain only 58 per cent. Fe. By purifying the hydrogen, passing it successively through concentrated permanganate of potassium solution, lead acetate solution, sulphuric acid, and finally over fused calcium chloride, three hours' exposure sufficed to reduce the ferric oxide, and there was obtained a dark gray powder, readily and completely soluble in dilute sulphuric acid without heat, and containing 99.68 per cent. Fe. It appears, therefore, that a satisfactory product necessitates the use of purified hydrogen.—T. Appel, Oesterr. Ztschr. f. Pharm., 1892, 395; Am. Jour. Pharm., 1892, 461.

Ferrum Reductum—Examination of.—Vulpius and Holdermann.—Archiv. der Pharm., 1892, 552. Compare also, Ibid., 1892, 321.

Estimation of Iron in Ferrum Reductum.—J. B. Nagelvoort. A combination of Power's and Leubert's suggestions (See Proc. 1892, 916; Archiv. der Pharm., 1892). Take 0.56 gram original substance; add 50 C.c. strictly 5 per cent. $HgCl_2$ solution; heat one hour to about 200° F. under frequent agitation and the usual analytical precautions (Bunsen's valve); cool; and dilute to 100 C.c. at 60° F. Filter. Measure 10 C.c. filtrate from a burette or with an accurate pipette (wash pipette, of course, and add washings to the 10 C.c.); add 10 C.c. 20 per cent. H_2SO_4; q. s. $\frac{n}{10}$ $KMnO_4$ solution until in slight excess (no necessity to add water—the $KMnO_4$ solution serves as a diluent); add 3 grams KI; expose (preferably in an Erlenmeyer) one hour to the normal temperature; titrate with $\frac{n}{10}$ "thio" (solution of hyposulphite of soda); place the decimal point obtained in the titration one figure to the right (in other words, multiply C.c. by 10) = per cent. Fe in the ferrum reductum.—Bull. Pharm., 1892, 509.

Lead.

Lead in Presence of Copper and Iron—Detection of Small Amounts of.—Feed. Add a few C.c. of ammonia, then a little KCy, and then ammonium sulphide. The iron is converted to ferro- or ferricyanide. CuS is soluble in KCy, and only PbS remains to give the characteristic brownish or blackish tint. This method is applicable when substances are present which reduce alkaline chromate.—Analyst, 1892, 142.

——— Feed (Analyst, xvii, 142). In beverages, etc., where these metals may be present in small quantities (NH_4) 2S is a delicate reagent. This, however, does not distinguish between Pb and Cu unless KCy is added, when a dark coloration is due to Pb only, the CuS being soluble in cyanide.

Determination of Lead.—Medicus (Ber. d. Chem. Ges., xiv, 2490) converts the lead to chloride, dissolves that in KOH, and then precipitates by passing CO_2 for a couple of hours. The precipitate is filtered off, washed and dissolved in HNO_3, and precipitated electrolytically as PbO_2. It was also found possible to precipitate as PbO_2 from the KOH solution above mentioned by passing a slow current of Br gas.

Lead—Volumetric Method for the Determination of.—F. C. Knight.—Jour. anal. and app. Chem., vi, No. 11; Chem. News, 1893, 128, etc.

Lead—Solubility of, in Cotton Seed Oil.—The following curious property of cotton-seed oil is mentioned in the Rép. de Pharm: A gallon of oil is poured into an iron vessel on whose bottom are spread 20 lbs. of melted lead. After this treatment the oil is decanted, and the lead, if then weighed, will amount to only 17 lbs., the remaining 3 lbs. having passed

into the oil. If this operation is repeated four times, one-half of the lead will be found to have disappeared. The oil thus impregnated may be applied like an ordinary paint, and will effectually protect metal against rust. —Drug. Circ., 1892, 178.

Lead Sulphide—Influence of Calcium Chloride upon the Precipitation of. —Pharm. Centralh., 1893, 273.

Assay of White Lead.—J. F. Liversidge.—Pharm. Era, 1893, 287.

Lead Chromate—Analysis of.—Chrome yellow, 2 Gm., is well shaken with binormal potassa solution, 20 C.c., until decomposition has been effected, basic lead chromate and potassium chromate being formed according to the equation $2PbCrO_4 + 2KHO = PbCrO_4,PbO + K_2CrO_4 + H_2O$. The mixture is then diluted with water, the liquid decanted, and the excess of alkali determined with normal sulphuric acid, phenolphthalein being used as an indicator; the amount of lead chromate is calculated from the difference of the alkali as above indicated.—Lachaud and Lepierre, in Bull. Soc. Chim., 3 ser., vi, 235; Am. Jour. Pharm., 1892, 366.

Lead and Potassium—Mixed Double Halides of.—Chas. H. Herty.—Am. Chem. Jour., 1893, 81 and 357.

Graphite and Graphitite.—W. Luzi.—Ber. d. Chem. Ges., xxvi, 890.

Litharge—Adulterated.—Containing ten per cent. of matter insoluble in acetic acid is reported by Dr. A. Schneegans; the adulterant was proven to be fine white sand, colored with a little ferric oxide.—Journ. Phar. Els.-Lothr., 1893, 41; Am. Jour. Pharm., 1893, 169.

Lead in Glass Wool.—L. Blum (Zeit. f. anal. Chem.) reports having observed that a sample of fine white glass wool, just purchased, became black after a stream of sulphuretted hydrogen gas had passed through it. The cause of this, on examination, was found to be the formation of lead sulphate, the glass having contained an oxide of that metal. Silicate of lead, being composed of fine fibres, is very easily attacked by acids; the usual practice of filtering the latter through glass wool ought, therefore, to be discontinued.—Drug. Circ., 1892, 228.

New Lead Alloy.—A new alloy of lead, very malleable, and almost unattacked by acid, has been proposed by M. Worms for the manufacture of accumulator plates. He takes 945 parts of lead, 22 of antimony, and 13 of mercury. The lead is first melted, the antimony is added, and the mercury is introduced at the moment of pouring into the ingot mould. A species of amalgamated lead is thus obtained which can be rolled in sufficiently thin sheets.—Meyer Bros.' Drug., 1892, 281.

Lithium.

Lithium Salts—Purity of.—Wm. Mair has examined seven samples each of commercial carbonate of lithium and citrate of lithium, of which two of each only were chemically pure, the remainder being reasonably pure and

free from added extraneous matter.—(Brit. Pharm. Conference) Phar. Jour. and Trans., 1892, 190.

Lithium Benzoate in Rheumatic Gout.—Adone (Jour. de Phar. et de Chim., Oct. 1, 1892) confirms the experience of Ure and Keller, that under the influence of benzoic treatment the conversion of uric acid into benzoic acid may be effected. The best effects were produced by the prolonged use of lithium benzoate, the conversion becoming so complete that the murexide reaction was no longer observable.

Lithium Bromate.—A. Politzin prepared an anhydrous and hydrated salt.—Abstract, Jour. Chem. Soc., 1892, 1275.

Lithium and Metals of the Magnesium Series—Double Chlorides of.—A. Chassevant.—Compt. rend., cxv, 113.

Lithium—Double Chlorides of.—A. Chassevant has prepared and studied the properties of the double chlorides of the following: Lithium and manganese; lithium and iron; lithium and copper; lithium and cadmium. —Le Progrès Thérap., 1892, 172; Pharm. Record, 1893, 107.

Magnesium.

Magnesium Citrate—Granular Effervescent.—Analysis of three brands by W. L. Scoville:

No. 1 English was composed of

Anhydrous sulphate of magnesium	6 parts.
Rochelle salt	30 parts.
Bicarbonate of sodium	30 parts.
Tartaric acid	28 parts.
Sugar	6 parts.
To make	100 parts.

No. 2 English:

Sulphate of magnesium	6 parts.
Sulphate of sodium	13 parts.
Carbonate of potassium	21 parts.
Bicarbonate of sodium	19 parts.
Tartaric acid	28 parts.
Sugar	13 parts.
To make	100 parts.

When dissolved, the carbonate of potassium and bicarbonate of sodium react with the tartaric acid and form 36 parts of Rochelle salt:

$$K_2CO_3,3H_2O + 2NaHCO_3 + 2H_2C_4H_4O_6 + 5H_2O \quad 2KNaC_4H_4O_6,4H_2O + 3CO_2.$$

The Philadelphia salt was composed of

Magnesium carbonate	2 parts.
Citric acid	18 parts.
Tartaric acid	24 parts.
Bicarbonate of sodium	29 parts.
Bicarbonate of potassium	16 parts.
Sugar	11 parts.
To make	100 parts.

—Pharm. Record, 1892, 267.

Manganese.

Manganous Sulphate—The Hydrates of.—C. E. Linebarger.—Am. Chem. Jour., 1893, 225.

Mercury.

Mercury—Its History and Preparations.—R. Burnes.—Brit. and Col. Drug.; Pharm. Era, 1893, 392.

Mercury—Purification of.—Abstract in Jour. Chem. Soc., 1893, 322.

Volumetric Assay for Mercury.—Namias (Chem. News, lxvi, 90). The mercury must be in the form of $HgCl_2$. It is then titrated with a standardized solution of $SnCl_2$, added gradually, until a drop of the solution gives a blue spot on a paper freshly saturated with Na_2MoO_4 solution. This marks the complete conversion to Hg_2Cl_2. $SnCl_2$ solution 2 to 3 grams per litre. Free HCl should be about 0.5 C.c. in 50 C.c. of the liquid titrated.—(From Rev. Univ. des Mines) See also Gazz. Chem. Ital., xxi, 361.

Mercury—Salts of.—The amount of mercury contained in the various salts of this metal has been calculated by Boquillon. The Revue de Thérap. gives the following table, according to Boquillon; the second column, giving the results according to Fischer.

Mercury Salt.	Boquillon.	Fischer.
Albuminate	10.20	....
Bichloride	72.72	73.80
Chloride	84.00	85.20
Biniodide	45.00	44.10
Iodide (yellow)	....	61.17
Cyanide	....	79.36
Lactate	67.10	....
Oxide	92.59	92.60
Peptonate	57.15	....
Phenate	51.68	....
Salicylate	59.00	....
Succinimide	63.30	....
Sulphide	....	86.20
Tannate	23.80	....
Thymolate	41.89	....

The results of Fischer are calculated theoretically; those of Boquillon were obtained experimentally.—Nat. Drug., 1892, 125.

Mercurous Salts—Action of Hydrogen Cyanide on.—D. Vitali confirms previous experiments showing that in the reaction between hydrogen cyanide and calomel, mercury, mercuric cyanide and hydrogen chloride are formed.—Abstract, Jour. Chem. Soc., 1892, 1416.

Mercurous-Ammonium Compound.—L. Pesci finds that the so-called mercurous-ammonium compounds consist of the corresponding mercuramonium salts mixed with metallic mercury, which separates as a precipitate on treatment with a saturated solution of ammonium sulphate containing ammonia, the salts being readily soluble in this medium. The gray powder obtained on treating calomel with ammonia contains metallic mercury, and is partially dissolved by ammoniacal ammonium sulphate solution. It is very unstable in the presence of light, but when preserved from disturbing influences the reaction occurring in its formation is probably represented as follows: $2\,Hg_2Cl_2 + 4\,NH_3 = Hg_2NCl,NH_4Cl + 2\,Hg + 2\,NH_4Cl$.—Gazetta, 21; Jour. Chem. Soc., cccl v, 685; Phar. Jour. and Trans., 1892, 4.

Mercurammonium Salts.—Action of Potassium Iodide or Sodium Thiosulphate on.—Balestra.—Gazz., xxii, 557; Jour. Chem. Soc., 1893, 278.

Mercurammonium Salts—New.—Balestra.—Gaz., xxii, 563; Jour. Chem. Soc., 1893, 304.

Mercuranilids—Compounds.—Piccinini and Ruspaggiari.—Gaz., xxii, 604; Jour. Chem. Soc., 1893, 322.

Mercuric Chloride in Spirituous Solutions.—J. R. Johnson recommends that the solution be prepared with rectified spirit, that it be chlorinated (according to Lister), and kept as much as possible from the light.—Phar. Jour. Trans., 1892, 375.

Mercuric Chloride.—Estimation of Mercury in Dilute Solutions. L. Vignon.—Compt. rend., cxvi, 584.

——— *as a Vesicant.*—Aubert, in Zeitschrift für Therap., recommends a one per cent. solution of bichloride of mercury as an efficient blistering agent. A compress wet with the solution, applied for six or seven hours, raises a large vesicle, the serum within being thoroughly aseptic. Aubert admits, however, that this mode of blistering is more painful than that produced by cantharides.

We may add that we have frequently noted the vesicating action of compresses of mercuric chloride in solutions as low as 0.1 per cent. (1 to 1000), and that this was invariably accompanied by serious complaints on the part of the patient because of the pain caused by the blisters.—Meyer Bros'. Drug., 1892, 229.

Absorption of Mercuric Chloride from Dilute Solutions by Cotton.—L. Vignon.—Compt. rend., cxvi, 517, 645.

Calomel—A Contribution to the History of.—J. H. Hunt.—Drug. Circ., 1893, 125.

Mercuric Cyanide.—This salt will not yield HCN by Jaquemin's test, but if to the mixture a few C.c. of hydrogen sulphide water be added, the distillate will contain HCN; this test is serviceable for the detection of mercuric cyanide even in presence of large quantities of ferrocyanide. While hydrogen sulphide easily decomposes the ferrocyanide in the absence of sodium bicarbonate, the addition of one per cent. of sodium bicarbonate completely prevents the decomposition.—Dr. W. Autenrieth, Arch. der Pharm., 1893, 99–109.

Mercuriodides of Organic Bases.—A. B. Prescott.—Amer. Chem. Jour., xiv, 606.

Mercuric Oxide.—To determine the influence of temperature in the preparation of precipitated mercuric oxide, C. Guldensteeden Egeling made a number of experiments: (1) Cold mercuric chloride solution (1 : 20) added to a cold dilute potassium hydrate solution gave an oxide, which dried, first between filtering paper, later in a desiccator, with oxalic acid solution (1 : 10), changed at once into the white mercuric oxalate. (2) The solutions of the same strength but boiling hot, gave an oxide which required some time to react with oxalic acid solution. (3) As in 2, but the boiling continued for some time (replacing the evaporated water), a portion of the oxide being filtered out at intervals of one-half hour; the color of all the precipitates was pure yellow, but toward oxalic acid solutions they showed differences—the longer the boiling was continued the less were the precipitates affected by oxalic acid. It is, therefore, not possible to change the yellow oxide into the red by boiling. (4) Repeating the experiments of Bosetti (Am. Jour. Pharm., 1890, 446), but using potassium hydrate instead of barium hydrate, it was possible to prepare an oxide which in physical and chemical properties was not to be distinguished from the red oxide obtained by igniting mercuric nitrate; the details are as follows: Into a boiling mercuric chloride solution (1 : 5) boiling concentrated potassium hydrate solution was dropped until the dark-brown color of the oxychloride was changed to a bright red and the liquid reacted faintly alkaline; the mixture was then poured into about twenty times its volume of boiling water, the precipitate collected, washed and dried.—(Ber. d. Niederl. Pharm. Ges.) Pharm. Ztg., 1892, 517; Am. Jour. Pharm., 1892, 567.

Mercury Phosphide.—Granger has obtained crystallized mercury phosphide by heating the iodide of phosphorus and mercury, in closed bent tubes, to 275° C. The resultant phosphide of mercury appears as rhombohedric crystals of the most brilliant metallic lustre.—Nat. Drug., 1892, 84.

Action of Piperidine on Mercurials.—R. Varet finds that piperidine re-

duces the halogen salts of mercury with extreme facility. The general action of piperidine upon mercurous salts is to decompose them into metallic mercury and mecuric salts.—Pharm. Jour. Trans., 1893, 608; from Compt. rend., 115, 880.

Hydrargyrum Sozoiodolicum is recommended to be dissolved in potassium iodide solution for hypodermic injections. F. Riederer always noticed a dark gray residue when making up the solution; this residue, amounting to about 0.5 per cent., was found to consist largely of metallic mercury, while the solution contained some red iodide of mercury. From this it is evident that potassium iodide solution cannot be used for the dissolving of the mercurial salt without decomposition.—Pharm. Ztsch. f. Russl., 1893, 101.

Succinimide of Mercury.—M. Julien's results of the treatment of syphilis by subcutaneous injections of this salt of mercury.—Les Nouv. Rem., 1892, 178; Am. Jour. Med. Sci., 1892, 717.

Hydrargyrum thymolo-aceticum when first placed upon the market had no definite chemical formula attached to it; recent investigation shows it to be formed from two molecules mercuric acetate, in which one acetyl group is replaced by the radical thymyl, so that it has the following formula: $Hg(C_2H_3O)_2 + Hg(C_2H_3O_2)(C_{10}H_{13}O)$.—E. Merck, Arch. der Pharm., 1893, 124.

Nickel.

Nickel—Action of, on Cheese.—It has been discovered that certain varieties of cheese are capable of corroding nickel far more quickly than vinegar or lactic acid. The hygienic value of this discovery may be appreciated when it is known that nickel-plated containers for cheese and similar viands are rapidly coming into use.—Nat. Drug., 1892, 84.

Nitrogen.

Nitric Oxide—Action of.—Sabatier and Senderens note that the only metal affected to any extent when heated in the presence of nitric oxide is lead. An incidental experiment, tried with spongy palladium, which had been previously saturated with hydrogen gas, yielded interesting results, for when the temperature was raised to 200°, incandescence was observed, and as a result the nitric oxide was found to be totally converted into water and ammonia, the palladium itself remaining unaffected.—Compt. rend., cxiv, 1429; Phar. Jour. and Trans., 5.

Nitric Oxide—Preparation of.—Van Deventer.—Ber. d. Chem. Ges., xxvi, 589.

——— *Density of.*—A. Leduc.—Compt. rend., cxvi, 322.

Nitro-Metals and Properties of Nitrogen Peroxide.—A new class of compounds, by Sabatier and Senderens.—Chem. News, 1892, 117; from Compt. rend., cxv, 236.

Derivatives of Nitrogen Halogen Compounds.—F. Lengfeld and J. Stieglitz.—Am. Chem. Jour., 1893, 215.

Determination of Nitrogen—Modification of Dumas' Process for the.—F. Blau.—Monats. f. Chem., 31, 277; Zeitschr. f. anal. Chem., 1893, 99.

Total Nitrogen (*Kjeldahl Process*).—Huguet (Jour. Pharm. Chem., [5], xxvi, 54) proposes to heat to boiling a mixture of 10 Gms. $KHSO_4$ and 5 C.c. conc. H_2SO_4, and then to add the material (little by little); if a liquid, drop by drop, the blackening of the acid being allowed to pass off more or less completely after each addition. The rest of the method is conducted as in the case of the Gunning modification. Substances which yield with difficulty to the process as ordinarily conducted, are more readily managed by this modification.

Kjeldahl Process—Gunning's Modification.—Winton (Bull. No. 112, Conn. Agr. Exp. Sta.) finds that the chief objection to Gunning's method lies in the frothing of the mixture (18 Gm. K_2SO_4 with 20 C.c. H_2SO_4) during the first stages of the operation. (With this proportion of K_2SO_4 the use of Hg or HgO is unnecessary). In the case of substances containing nitrates, the reduction of the nitrates with H_2SO_4, salicylic acid and zinc (Scovell's method) must be performed before any K_2SO_4 (12 Gm.) is added, otherwise the heat which must be applied to keep the mass liquid is too high. When the organic matter has been destroyed, water is added gradually to maintain the solution. The distillation with NaOH is finally conducted in the usual manner.

Arnold and Wedemeyer (Zts. anal. Chem., xxxi, 525) find that the destruction of the organic substance proceeds more rapidly if the Gunning method is combined with the use of HgO and $CuSO_4$, as recommended by Arnold. (Ztg. anal. Chem., xxv, 581). The K_2SO_4 was added a little at a time to moderate the frothing. In the distillation, if Zn dust is added, the use of K_2S is unnecessary.

Nitrites—Quantitative Determination.—Grossman.—Chem. Zeit., 1892, 818.

Nitrites.—Grossman (Chem. Zeit., xvi, 818), finds that on adding dilute H_2SO_4 to a boiling solution of nitrite this reaction occurs: $3NaNO_2 + H_2SO_4 = Na_2SO_4 + NaNO_3 + 2NO + H_2O$. By using normal or fractional normal H_2SO_4 the determination can be effected. The acid should be standardized against nitrite of known purity. If the commercial sample tested contains free or carbonated alkali, this should be determined by a titration in the cold and a correction made.—Chem. Zeit., xvi, 818.

Nitrites by means of Schöffer's Reaction—Gasometric Estimation of.—Van Deventer.—Ber. d. Chem. Ges., xxvi, 958.

Nitrogen in Nitrates.—Arnold and Wedemeyer.—Zeitschr. f. analyt. Chem., 1892, 388.

Nitrogen in Nitrates by Smith's Method.—Determination of. K. Wedemeyer.—Arch. der. Pharm., 1893, 372.

Nitrates and Nitrites—Determining.—Ulsch.—Zeitschr. f. analyt. Chem., 1892, 392.

Nitrogen in Organic Nitrates.—Estimation of. P. Rubtzoff. Apparatus described and figured in Jour. Chem. Soc., 1893, 184.

Nitrogen in Organic Substances.—Abstracts from various sources.—Zeitschr. f. anal. Chem., 1893, 235–242.

Organic Nitrogen—Estimation of.—A. Petit and L. Monfet (Jour. Pharm. Chim., 1893, 297). The nitrogen is converted into ammonium sulphate by fuming sulphuric acid and mercury, then liberated from this combination by alkaline hypobromite and measured in the usual way.

Nitrogen in Organic Substances—Dumas' Method of Estimating.—J. O'Sullivan.—Jour. Soc. Chem. Ind., xi, 327.

——— *Stock's Process for the Estimation of.*—Modification of this apparatus by the author.—Analyst, xviii, 58.

Ultimate Analysis of Nitrogenous Substances.—Gehrenbeck, in Ber. d. Chem. Ges., 22, 1694; Klingemann, ibid., 3064.

Osmium.

Osmium—Fusion of.—Joly and Vézes report (Compt. Rend.) that they have succeeded in fusing osmium, the most refractory member of the platinum group. Metallic osmium, which occurs as small grayish-blue crystals, was heated in an electric furnace in a carbon crucible, and in an atmosphere of carbon dioxide. At the highest temperature of the electric arc, the metal was fused without appreciable loss by volatilization. After fusion it was exceedingly hard, and capable of cutting glass, or scratching quartz, but not affecting the topaz, whilst it appeared to remain unaffected by the oxygen of the air. It is remarkably like ruthenium in many of its properties, but differs from it in aspect, having a blue metallic lustre, whilst ruthenium is whiter than platinum and resembles burnished silver.—Drug. Circ., 1893, 107.

Oxygen—Production of.—J. Volhard employs the mutual reaction of hydrogen and chloride of lime. (Liebig's Ann.).

——— G. Kassner employs potassium ferricyanide with hydrogen peroxide in presence of alkali. (Chem. Zeit.).—Chem. News, 1892, 150.

Oxygen.—J. E. Leebold refutes the statement made by C. W. Faulkner. (See Proc. Cal. Pharm. Assoc., 1892, 27; Proc. A. P. A., 1893).—Pharm. Review, 1892, 221.

——— *Preparation of.*—Achille Tonneau uses the following simple process by which the danger of explosions and the inconvenience of having the product contaminated with chlorine are avoided. Into a Woulff's bottle of 2 or three liters capacity, supplied with a funnel tube containing concentrated acetic acid, is introduced a mixture of 100–200 Gm.

binoxide of manganese and peroxide of barium, with sufficient water to cover it, and to prevent foaming a layer of oil is added. Several C.c. of the acid are introduced through the stopcock of the funnel tube, when the reaction commences at once and the oxygen is passed to a wash-bottle, and from there is received into a rubber bag. For introducing air into the apparatus and regulating the disengagement of the gas, a rubber bulb is attached to the flask by means of rubber tubing. The apparatus is illustrated in L'Union pharmaceutique, 1893, p. 233; Amer. Jour. Pharm., 1893, 339.

Liquid Oxygen—Magnetic Properties of.—Dewar.—Chem. News, 1893, 210.

Stream of Oxygen—A Convenient Method of Obtaining.—D. B. Dott.—Pharm. Jour. Trans., 1893, 702.

Liquefied Air.—Prof. Dewar. A lecture upon.—Pharm. Jour. Trans., 1893, 622.

Ozone as a Therapeutic Agent.—In a paper read recently before the French Society of Electrotherapy, Drs. Larat and Gautier prove that the clinical results observed from ozone as a therapeutic agent are far from being constant, and are even in contradiction with the physiological experiences.—Rev. Internat. de Bibl. Med., July 25, 1892; Am. Jour. Pharm, 1892, 466.

Ozone.—The recent practical improvements in generating ozone, with considerations of its place in nature and medicine.—N. Y., 1892, p. 32.

Phosphorus.

Black Phosphorus, obtainable by the prolonged action of ammonia and heat upon ordinary powdered phosphorus, until the powder remaining becomes permanent in air and ceases to smell of hydrogen phosphide, has been proven to be *arsenic;* the ammoniacal solution contains the salts of the lower acids of phosphorus, but is free from phosphates and arsenic salts. The presence of the arsenic in the commercial phosphorus is traceable to the sulphuric acid used in its preparation; the phosphorus is considered to hold the arsenic dissolved, and when acted upon by ammonia may give rise to a red or brown-colored powder which, however, disappears after some time, leaving a black, lustreless powder composed of metallic arsenic.—F. A. Flückiger, Archiv der Pharm., 1892, 159; Am. Jour. Pharm., 1892, 371.

Red Phosphorus, also well known as amorphous phosphorus, has been proven by J. W. Retgers to be crystalline and doubly refracting, by examining the powder immersed in di-iodomethane; the thinnest fragments were found to be transparent, having a beautiful carmine or scarlet color. It is possible that the so-called metallic phosphorus, which also in minute fragments transmits a red light, is nothing more than a better crystallized red

phosphorus; should this be verified, there would be but two modifications of phosphorus: the yellow crystallizing in the regular system, and the red belonging to the hexagonal system.—(Ztschr. anorg. Chem.) Chem. Repert, 1893, 142.

Phosphates—New Method for the Determination of.—C. Wavelet, in Rép. de Pharm., 1893, 153.

Phosphates of Quinine, Barium, etc.—George Coull finds that there are at least two phosphates of quinine. He found barium hypophosphite to have considerable variation, and recommends that the anhydrous salt be used and the standard of purity raised.—(Brit. Pharm. Conference.) Pharm. Jour. and Trans., 1892, 234–236.

Antidotes to Phosphorus.—E. Q. Thornton concludes that permanganate of potassium is the best antidote. It must be used before the poison has become absorbed, and must be well diluted (one-half to one per cent. solution) or vomiting will result before the chemical action has taken place in the stomach. An excess must be given, as considerable of the permanganate is reduced by the organic substances in the stomach.—The Therap. Gaz., 1893, 8.

——— Potassium permanganate has been recommended by Bokai (St. Petersburg med. Woch.) as an antidote in phosphorus poisoning. Dr. Hognos, of Buda-Pest (Gyógyaszat, 1892, No. 2) has treated two cases of phosphorus poisoning successfully with the permanganate, though in both cases a large quantity of phosphorus had been taken. In each the stomach was first washed out with tepid water, and then 15 ounces of a 1/2 per cent. solution of permanganate of potash injected into the stomach and left there.—The Med. Chronicle, September, 1892.

Phosphorus Poisoning—Turpentine in.—O. Bush recommends the use of turpentine as an antidote in cases of poisoning from phosphorus. It is suggested that the action of turpentine may be due to the formation of an analogous compound to that obtained by Koehler, and named by him terebintho-phosphoric acid. This, though poisonous, is less energetic in its action than phosphorus itself.—Vratch., 1892, 504; Phar. Jour. and Trans., 1892, 183.

Movement of the Element Phosphorus in the Mineral, Vegetable and Animal Kingdoms, and the Biological Function of the Lecithines.—W. Maxwell.—Am. Chem. Jour., 1893, 18..

Platinum.

Platinum in Russia—Production of.—According to the Journal de la Chambre de Commerce de Constantinople, the platinum beds of the Ural mountains are the only ones in the world in which this metal is found in grains. Throughout the whole world only about 3,270 kilograms of platinum are annually used, and it is stated that the platinum beds of Bisserski

can alone supply the total quantity required for the consumption of the world.—Phar. Jour. and Trans., 1892, 107; from Jour. Soc. of Arts.

Potassium.

Potash.—Official Methods of Analysis of the Assoc. of Official Agric. Chem. for 1890–91.—Chem. News, 1892, 5.

Potassium Estimation.—Jean and Trillat (Bull. Soc. Chim. (3), 7, 228); *Wense* (Zeitschr. f. angew. Chem., 1891, 69); *Payne* (Bull. No. 35, of Assoc. of Agric. Chem., Report for 1892); *Hilgard* (Zeitschr. f. analyt. Chem., 1893, xxii, 184).

Lindo–Gladding Process—Estimation of Potassium by the.—Holleman finds the process trustworthy.—Chem. Zeit., 1892, 1920.

——— Breyer and Schweitzer have a different experience from Holleman.—Chem. Zeit., 1893, 101.

Potassium Bromide.—Mr. Dott suggests that an additional test be introduced into the Pharmacopœia, fixing a limit to the percentage of silver salt yielded by precipitation, and specifying a minimum percentage of loss on fusing the same in a current of chlorine.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 210.

Potassium Chlorate and Alcohol—Caution against Mixing.—Schneider (Pharm. Centralh., 1892, 331,) says that if a few little crystals of potassium chlorate, moistened with alcohol, be rubbed in a mortar, a number of little explosions will follow, making a noise like the crack of a whip. If a crystal of the chlorate be wet with alcohol, placed on an anvil, and struck a sharp blow with a hammer, a violent detonation will ensue.

These observations point to the danger of mixing potassium chlorate with alcohol, and especially of rubbing up such a mixture.

Potassium Dichromate.—This salt has been used by Dr. J. H. Hunt (Brookl. Med. Jour., August), as an expectorant with favorable results; the dose for a child one year old being $\frac{1}{10}$ grain, repeated in an hour, or if necessary, at shorter intervals. To dispense it for this purpose it is best kept in the form of a trituration of one part of the salt with nine parts of milk sugar. A solution of this triturate rarely acts as an emetic.—Am. Jour. Pharm., 1892, 552.

Potassium Dithiocarbonate (K_2COS_2).—Tommasoli and Vicini have used this salt with success in various forms of skin disease as ointment, and also in water solution containing as much as 5 per cent. Stronger preparations are sometimes productive of unpleasant effects. The salt is an orange-red, crystalline and deliquescent powder, readily soluble in water, slightly so in alcohol. It is prepared by the action of carbon bisulphide upon caustic potash solution at the boiling point. The authors share the opinion of Unna that the efficacy of sulphur preparations is entirely due to the evolution of sulphuretted hydrogen, which is a result of their gradual

decomposition.—Monatsch. f. pract. Dermatol, 1892, 427 ; Phar. Jour. and Trans., 1892, 341.

Potassium Cyanide.—Commercial specimens of this salt frequently contain a notable percentage of sodium cyanide. Kayser (Chem. Zeit., 1892, 1148) calls attention to the fact that it is possible to overlook as much as 15 per cent. of impurities, owing to the difference in atomic weights of potassium and sodium.

Potassium Cyanide—Preparation of Pure.—Dry separately at a mild heat 1 kilogram of potassium ferrocyanide and 750 grams of acid potassium chromate, powder, sift and mix thoroughly. Place a capacious iron capsule over a gas flame and heat thoroughly, but not to the point of redness. Into this capsule throw the mixed powder in quantities of from 5 to 10 grams. The light powders will turn black, and oxidation takes place with a glow like that of tinder. When a portion becomes quite black the reaction is complete, and another portion may be added. The mass should be stirred from time to time with an iron spatula. Care should be taken that the temperature be not allowed to rise so as to fuse the mass together. It must be light and porous. When the reaction is complete boil the mass with five times its volume of alcohol, and draw off the alcoholic solution of potassium cyanide from the sediment, for nearly all of it can be drawn off clear without filtering. To precipitate the dissolved cyanide put the vessel in cold water and stir thoroughly with a glass rod. The cyanide deposits as a pure white crystalline powder. Pour the alcohol again on the mass, and after boiling filter off and repeat the operation with an equal quantity of alcohol until no more cyanide separates out on cooling.—Amer. Drug. and Pharm. Record, 1893, 372 ; from Pharm. Zeit.

Potassium Ferrocyanide.—W. Autenrieth (Archiv. der Pharm., 1893, 99). This salt, generally considered to be a fairly stable compound, has been found in a recent investigation to be decomposable, not only by the weakest acids, but also by numerous non-acid organic substances, hydrocyanic acid being liberated. The dilute mineral acids containing even less than 0.1 per cent. formic, acetic, butyric, lactic, tartaric, benzoic, etc., acids, even carbonic acid and hydrogen sulphide, phenols, peptones, casein, etc., will decompose potassium ferrocyanide more or less quickly at temperatures below 100° C., liberating a portion of the hydrocyanic acid and forming white insoluble potassium ferrous ferrocyanide $K_2Fe(Fe(CN)_6)$; with carbonic acid the reaction is $2\ K_4Fe(CN)_6 + 3\ CO_2 + 3\ H_2O = 6\ HCN + K_2Fe\ (Fe(CN)_6) + 3\ K_2CO_3$. In the manufacture of hydrocyanic acid from the ferrocyanide and sulphuric acid, the residue consists of the above salt, from which the sulphuric acid extracts a part of the iron as ferrous sulphate, which by oxidation changes to ferric salt, and this then reacts with the ferrocyanide, forming Prussian blue, thus explaining the blue color of the residue. The acids in the gastric juice (hydrochloric and lactic)

decomposing potassium ferrocyanide, direct experiments were made with artificial gastric juice at a temperature of 37–40° C., with the result that after a short time, evidence was obtained showing the formation of hydrocyanic acid. Casein and peptone, in the absence of free acids, under the same conditions, liberated but traces of hydrocyanic acid. The non-poisonous action of potassium ferrocyanide is explained by the decomposition being very slow, but if the administration be followed by that of an acid (a case is cited in which tartaric acid was taken afterward), death is rapidly caused. The decomposition of potassium ferrocyanide by dilute acetic acid has some importance in the examination of urine for albumen by the ferrocyanide test; a turbidity, occurring only after some standing, may not be due to the presence of albumen, but the formation of insoluble potassium-ferro ferrocyanide. The detection of hydrocyanic acid or simple cyanides, excepting mercuric cyanide, in presence of potassium ferrocyanide, is alone possible by Jacquemin's method, in which the material is distilled after the addition of a considerable quantity of sodium bicarbonate. This salt will not unite with free hydrocyanic acid, nor will it decompose potassium ferrocyanide. The distillate from 0.01 gram potassium cyanide, 10 grams ferrocyanide and 200 C.c. water, will give a pronounced test for hydrocyanic acid.

——— *Hydrocyanic Acid and Cyanides in.*—(Ibid., 107). Free hydrocyanic acid and cyanides in potassium ferrocyanide may be detected with certainty only by means of Jacquemin's test. This consists in distilling the substance with considerable sodium bicarbonate. If uncombined hydrocyanic acid appears in the distillate, then it was present as such in the substance or else in the form of metallic cyanide, mercuric cyanide excepted.

——— *and Nitrites.*—West. Drug., from Pharm. Centralh. It was observed by Schöffer that when to a very dilute solution of potassium nitrite were added a few drops of potassium ferrocyanide solution with some acetic acid, a deep yellow coloration supervened. Deventer has recently explained the reaction which occurs, there being a change from ferrocyanide to ferricyanide, with the formation of potassium acetate and nitrosyl, according to this equation: $2K_4FeCy_6 + 2HNO_2 + 2H_3C_2H_3O_2 = K_6Fe_2Cy_{12} + 2KC_2H_3O_2 + 2NO + 2H_2O$.

This reaction may be utilized for quantitatively estimating nitrites in the presence of nitrates.

Potassium Hydroxide.—D. B. Dott examined a number of samples of potassium hydroxide from various sources, and found the lowest to contain but 72.80 per cent. KOH and the highest 77.06 per cent. KOH. With methyl-orange as an indicator, the results are higher, due to carbonate present. In these results he used phenolphthalein.—Phar. Jour. Trans., 1893, 619.

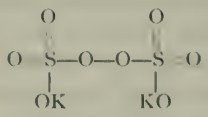
Potash—Insects that Form.—O. Lugger states that the imago of the Dicranura vinula, in emerging from the cocoon, produces, probably from the mouth, a solution of caustic potash for the purpose of softening the cocoon.—Pharm. Review, 1893, 18.

Potassium Permanganate, an Antidote to Phosphorus.—Bokai and Forangi, in La Terap. mod., 1892, 538; Rép. de Pharm., 1893, 78. (See Phosphorous.)

——— *Stability of Solutions of.*—Poleck found that when kept in properly protected vessels the $\frac{1}{10}$ per cent. solution, after 12 months' exposure to diffused light, has shown no change, and after 18 months' exposure has lost only 2.61 per cent. of its value; when kept in the dark for 18 months the same solution has lost only 0.94 per cent. of its strength. The $\frac{3}{10}$ per cent. solution has shown still better results; after exposure for 18 months to diffused light no change whatever in its value could be discovered.—Pharm. Rev., 1892, 179.

——— Gruzner (Archiv. der Pharm., ccxxxi, 321,) finds that solutions of 1 : 1000 kept their strength for a year in diffused daylight or in blackened glass bottles. After 18 months, solutions of this strength kept in colorless glass in diffused daylight had lost by 2.61 per cent.; in blackened glass, loss =0.94 per cent. Solutions of 3 : 1000 kept perfectly during the same periods and under the same conditions.

Potassium Supersulphate.—This salt was first prepared by Berthelot, who assigned to it the formula KSO_4. This, however, cannot be accepted as correct, since such a formula assigns to sulphur a septemvalency, something inadmissible for an artiad element. By doubling the formula, thus, $K_2S_2O_8$, the sulphur would appear octivalent, and although there are grave reasons against this view, Jahn, in a communication to the German Chemical Society, has rendered this theory quite probable. Thoms (Pharm. Centralh.) suggests this graphic formula:



The salt is obtained by subjecting potassium bisulphate to electrolysis, being careful to keep down the temperature. A strong odor of ozone is developed during the operation.—West. Drug., 1892, 261.

Solubility of Cream of Tartar in Diluted Alcohol.—W. H. Wenger.—Am. Chem. Jour., 1892, 624.

Alum in India—Manufacture of.—Pharm. Era, 1892, 360; Chem. and Drug., 1892, 636.

Alum in Bread—Test for.—(Chem. Zeit., Meyer Bros.' Drug., 1892, 269). A very delicate reaction for this purpose is that given by a one

per cent. alcoholic solution of alizarine. It imparts a bright red color to bread which contains alum, while an unadulterated sample merely turns light brown.

Ruthenium.

Ruthenium Red.—The color discovered by M. Joly in his researches on the ruthenium ammoniacal compounds rivals the most brilliant coal-tar pigments by its tinctorial intensity. The author has observed that ruthenium red is the best reagent for the pectic compounds, which are always associated with cellulose in young tissues, and in old tissues which have not been modified by foreign matters. It is the only reagent for the transformation products of the pectic compounds, *i. e.*, the majority of gums and mucilages.—L. Mangin, Amer. Drug. and Pharm. Record, 1893, 361.

Cast Ruthenium—Physical Properties of.—A. Joly in La Nature; Nat. Drug., 1893, 139.

Silver.

Silver.—M. C. Lea.—Amer. Jour. Sci., 44, 444.

——— *Chloride.*—Ibid., 446.

Silver Nitrate—Reduction by the Action of the Sun.—An explosive phenomenon by Roux.—Jour. Pharm. Chim., 1893, 510.

Sodium.

Metallic Sodium is best preserved in paraffin oil, says Vaubel in Zeitschr. f. angew. Chem. The crust that forms on the sodium when kept under petroleum does not occur in paraffin oil. When the metal is to be used the oil is wiped off by means of filter paper.

Sodammonium.—M. Joannis describes a curious compound of lead, sodium and ammonium, $Pb_4Na_2NH_3$ in Compt. rend.—See West. Drug., 1892, 255; Nature, vol. xliii, 399.

Sodium Acetate—Reactions of.—F. Collischonn. Chem. Zeit., 1892, 1921. The varying statements regarding the reaction of sodium acetate in aqueous solution led Dr. F. Collischonn to prepare sodium acetate from perfectly neutral and also from distinctly acid solutions; the action towards litmus paper and even towards phenolphthalein proved that the solution of the salt is *alkaline* to both indicators and that the salt could contain small quantities of free acetic acid without changing the result. In the titration of acetic acid with sodium hydrate solution neither of these indicators will give exact results. Fifty grams sodium acetate (containing no free acetic acid) dissolved in 50 grams water required in cold solution 1 C.c. $\frac{n}{10}$ hydrochloric acid to give neutral reaction towards phenolphthalein; if the solution be boiled, 3 C.c. more of the acid must be added to give neutral reaction. The addition of 4 C.c. acid to this solution still gave a liquid having alkaline reaction tested with litmus or turmeric paper. To test the acetate for carbonate it is recommended to

dissolve 10 Gm. of the salt in 100 Gm. of water, and add 1–2 drops phenolphthalein solution; in the absence of carbonate of sodium one drop *n*-hydrochloric acid will decolorize the solution.

Borax by a New Process.—H. N. Warren has devised a new process for producing borax, which consists in the action of crude boric acid upon common salt by means of superheated steam.—Chem. News, 1893, 244.

Borax—The Story of American.—J. K. Spears.—Oil, Paint and Drug. Rep.; Drug. Circ., 1892, 197–199.

Sodium Carbonate, in form of small crystals, is prepared, according to a German patent, by adding to 100 parts of the effloresced carbonate 70 parts of water 80–90° C.; by mixing the doughy mass the carbonate unites with the water, swelling into a mass of fine crystalline needles, which, after cooling, can be at once put into suitable packages. A foaming preparation for washing is obtained if in the water used to mix with the soda there be dissolved a desirable quantity of soap.—(Ztschr. f. angew. Chemie), Pharm. Centralh., 1893, 171; Am. Jour. Pharm., 1893, 287.

C. P. Soda Containing but one Molecule of Water of Crystallization.—Pharm. Centralh., 1892, 642.

Analysis of Washing Powders.—W. J. Kinney, W. H. Wenger, and F. P. D.—Am. Chem. Jour., 1892, 623.

Glauber's Salt in the Potash Mines of Kalusz.—R. Zaloziecki.—Abstract, Jour. Chem. Soc., 1892, 1286.

Sodium Thiosulphate Solution—Tenth Normal.—T. Salser, in Pharm. Centralh., 1892, 593.

Sodium Peroxide.—Prude 'Homme in Ch. Trades Jour.; Pharm. Era, 1892, 360. An account of its preparations, properties and uses.

Sodium Peroxide, Na_2O_2, contains 41.02 per cent. oxygen, of which one-half is available as a bleaching agent. The anhydrous oxide is produced when sodium burns in dry air or oxygen; when the monoxide or its hydrate is strongly heated in a current of air; also by the ignition of sodium nitrate. It is not decomposed by strong heat, but boiling the aqueous solution readily effects decomposition. The hydrated peroxide results by adding hydrogen peroxide to a twenty per cent. solution of sodium hydrate, and can be precipitated by the addition of alcohol.—Südd. Apotheker Ztg., 1892, 411; Am. Jour. Pharm., 1893, 133.

Sodium Peroxide, a commercial article, appears as a deliquescent yellowish, sintered mass or powder; it is soluble in water with evolution of considerable heat and liberation of oxygen; in dilute acids it is soluble, forming hydrogen peroxide if the solution be kept cool. Because of its strongly alkaline character its use as a bleaching agent is restricted, since it attacks animal fibers; a recent patent application proposes the use of

magnesium salts with the sodium peroxide, whereby magnesium peroxide is produced, which acts very favorably as a bleaching agent for wool, silk, mixed fibres, feathers, bristles, bones and ivory; bleaching in this manner is more quickly finished than with the use of hydrogen or barium peroxide. Under the name Oxygen Powder a mixture of magnesium sulphate and sodium peroxide can be purchased; in its use it is essential to add it slowly in small portions to cold water.—(Bayr. Ind. u. Gewerbebl.) Pharm. Central., 1892, 699.

Sodium Phosphate.—Subcutaneous injections of this salt are used by Crocq with good results in nervous affections; he uses a solution of 2 Gm. in 100 Gm. of cherry laurel water, of which about 3 Ccm. are injected under strict antiseptic precautions. He considers it a powerful nerve tonic when used in this manner.—Gaz. Médicale de Liége, Oct., 1892; Am. Jour. Pharm., 1893, 130.

Sodium Salicylate—Adulterated.—J. E. Gerock recently came in possession of a sample of sodium salicylate, the red color of which was corrected by the addition of a quantity of salicylate which had been colored distinctly blue. Owing to the minute quantity of coloring matter present it was impossible to identify it, but it is believed to be of artificial organic origin.—Journ. d. Pharm., Elsass-Lothringen, 1892, 142; Am. Jour. Pharm., 1892, 370.

——— *as a Solvent.*—Conrady (in Jour. Pharm. d'Anvers., xxvi, 120; Pharm. Jour. Trans., 1892, 345). The author has previously observed that the fluid extract of cascara is miscible with water in all proportions when an aqueous solution of sodium salicylate has been previously added to it, now states the results of further experiments with the same substance as a solvent. Phenol dissolves in the salicylate solution readily, loses in part its toxic properties, and then mixes in all proportions with water. Creosote also dissolves, but the subsequent addition of water produces a milkiness. Guaiacol is more soluble than creosote. A mixture of equal parts of creosote and sodium salicylate solution (equal parts of water and the salt) has a syrupy consistence, and forms a good pill-mass on the addition of liquorice powder. The mass remains soft for a considerable period. Menthol and thymol are dissolved by the aid of the salicylate, as also are essential oils. It is noted that when turpentine is present in the latter, a larger proportion of the salicylate is required for their complete solution than when the oils are pure.

Strontium.

Strontium Salts—Preparation of Pure.—Barthe and Faliéres suggest (Bull. Soc. Chim., 3 ser., vii, 104,) the following process: Dissolve strontianite or strontium sulphide in dilute hydrochloric acid. precipitate Fe and Al by ammonia, add excess of sulphuric acid, wash the precipitate by decantation until Ca has been completely removed, pour upon the precipi-

tate excess of ammonium carbonate solution, agitate occasionally during two days, and then thoroughly wash the mixed strontium and barium sulphates and carbonates; treat this residue with dilute hydrochloric acid, filter after 24 hours, add to each liter of liquid 200 Gm. sulphuric acid, spec. grav. 1.17, digest for several hours with 2 or 3 Gm. of freshly precipitated strontium sulphate, which will be dissolved by the strongly acid liquid and precipitate any barium still in solution; then filter, evaporate to dryness, again dissolve in water, and crystallize. Thus prepared, the salt shows only the lines of strontium in the spectroscope.—Am. Jour. Pharm., 1892, 466.

Strontium Salts.—C. O. Curtman contributes some notes on the solubilities and properties of strontium bromide, iodide and lactate, in Pharm. Rund., 1893, 32.

Strontium Bromide has been found useful by Coronedi (Rép. de Phar., Oct., 1892) in persistent vomiting originating from various causes. Given in two or three daily doses of 1 Gm. after meals, its good effects are observed more or less rapidly, even in obstinate vomiting of pregnancy.—Am. Jour. Pharm., 1893, 14.

Strontium Salts in Medicine.—According to the Therapist, many strontium salts exert a well-marked antiputrescent and antiseptic power on the tissues and excreta. Care must be exercised to ensure their purity, and particularly their freedom from barium.—Phar. Jour. Trans., 1893, 344.

——— According to Le Formulaire, the bromide and oxide are prescribed in the same manner as the similar salts of potassium and sodium, but possess an advantage over these in that the dose may be increased more freely without risk.—Phar. Jour. and Trans., 1892, 267.

Strontium Preparations.—Bardet (Rev. de Thérapeut., 1892, 410) prescribes the iodide and bromide of strontium in a like manner as the salts of potassium and sodium; however, without the fear of producing gastric intolerance.

Syrup of Strontium Bromide.—Syrup of sweet orange, syrup of bitter orange, āā 150 Gm., strontium bromide, 30 Gm.

Solution of Strontium Iodide.—Distilled water, 300 Gm., strontium iodide, 20 Gm.

Solution of Strontium Lactate.—(C. Paul) Distilled water, 250 Gm., strontium lactate, 50 Gm.—Am. Jour. Pharm., 1892, 517.

Elimination of Strontium Bromide.—Féré reported to the Biological Society, at the June meeting, that this salt is rapidly and completely eliminated by the urine, and though this elimination begins later, there is less accumulation of this salt in the system than of potassium bromide.

Effects and Uses of Strontium Salts.—In as essay upon the physiological effects and therapeutic uses of these salts (abstract in Revue internat.

de Bibliogr. Méd., October 10, 1892, p. 330), Armand Malbec, of Paris, states the adult dose of the lactate to be from 2 to 10 Gms., while the bromide and iodide may be given in the same doses as the corresponding potassium salts; the sulphate and phosphate being insoluble may be given in wafers, or mixed with food, or preferably in the form of biscuits. The author finds the salts to be non-poisonous; they appear to facilitate the nutritive acts in the organism, more particularly the lactate; to sensibly augment the intravascular tension on the one hand, and on the other hand to retard the peptonization of the albuminoids, thus effecting a favorable action in certain pathological conditions.

The author regards the lactate as being indicated in certain forms of albuminuria and also in gastric affections, characterized by hyperpepsia with accompanying pain; it may even advantageously replace the alkali bicarbonates. Bromide of strontium is a substitute for potassium bromide, is better tolerated by the stomach, and does not cause the condition of bromism. Strotium iodide should be preferred to potassium iodide as a cardiac and circulatory medicament, in case the latter be not well tolerated.

Strontium Nitrate is a good diuretic. *Strontium sulphate* and *phosphate*, notably the latter, may be utilized as antiseptics, antiparasitics and restoratives.

Strontium Phosphates.—L. Barthe has prepared the following (Compt. rend., cxiv, 1267):

On adding a cold ammoniacal solution of sodium phosphate, 90 parts, to ammoniacal solution of strontium chloride, 100 p., amorphous *normal strontium phosphate*, having a bluish tinge, is precipitated: dried at 100° C. it is anhydrous.

On using acidulated solutions of strontium chloride, 70 p., and sodium phosphate, 100 p., at a temperature not exceeding 50° C.. a gelatinous precipitate of *distrontium hydrogen phosphate* is produced, gradually becoming granular, and by the heat of the blow-pipe is converted into bluish *pyrophosphate*. Its solution in cold phosphoric acid concentrated below 50° C., yields tabular crystals of $2SrO,H_2O,3P_2O_5 \cdot 7H_2O$, which are soluble in water.

Equal volumes of decinormal solutions of phosphoric acid and strontium oxide yield a precipitate having the composition $SrH_4(PO_4)_2+2H_2O$.—Am. Jour. Pharm., 1892, 605; also Pharm. Jour. Trans., 1892, 345.

Sulphur.

Sulphur in Alcohol—Solubility of.—At the boiling point 265 parts alcohol will dissolve one part sulphur; after filtering the solution remains clear, unless agitated, for at least four hours, after which time the excess of sulphur commences to separate, this being complete in about 30 hours; 3300 parts alcohol at ordinary temperature will then contain dissolved only one part sulphur.—Dr. C. Schierholz, Pharm. Post, 1892, 573.

Sulphur—The Iodides of.—By Herbert McLeod. An investigation upon the properties of this compound. The fusing point being lower than those of iodine and sulphur would indicate that some chemical action takes place when the elements are mixed together, but its properties more resemble those of a non-metallic alloy than of a definite chemical compound.—Chem. News, Sept., 1892.

Crystallized Sulphates—The Efflorescence of.—The efflorescence of crystallized sulphates like those of zinc, cobalt, and iron, according to A. Baubigny and E. Péchard (Compt. rend., cxv, 171), is very materially hastened through the presence of small quantities of uncombined acid.—Amer. Jour. Pharm., 1893, 14.

Anhydrous Crystallized Sulphates have been prepared by P. Klobb (Compt. rend., cxiv, 836,) by mixing the metallic sulphate with excess of ammonium sulphate, and heating the mixture in a partly covered crucible until the latter salt has been completely expelled, but not increasing the heat to the decomposition of the former. In this manner $ZnSO_4$ has been prepared in colorless octahedra, $CuSO_4$ in gray needles, $CoSO_4$ in purplish-red, and $NiSO_4$ in yellowish-green octahedra.

Thiosulphates.—A. Purgotti has succeeded in preparing organic thiosulphates containing unsaturated groups.—Abstract, Jour. Chem. Soc., 1892, 1418.

Estimation of Sulphur by Eschka's Method.—Hundeshagen (J. Anal. and App. Chem., vi, 385) finds that when Na_2CO_3 is used, some loss of H_2S occurs, which is not the case if K_2CO_3 is used instead. The mixture recommended is 2 parts MgO with 1 part calcined K_2CO_3, of which 2 Gm. are used per Gm. of coal.

Sulphur.—Attention has been drawn by Prof. Schulz (Berl. klin. Wochenschrift, 1892, No. 13) to the value of sulphur in certain cases of chlorosis in which iron proves inefficient, and which are not complicated with catarrhal and inflammatory conditions of the digestive tract. The sulphur was used in the form of flowers of sulphur mixed with sugar of milk, as much being taken three times a day as would lie on the point of a knife.—Am. Jour. Pharm., 1893, 191.

Tin.

Tin—A Gray Modification of.—E. Hjelt, in Chem. Zeit., 1892, 1197. An allotropic modification of this metal has been described by various authors, but no satisfactory explanation of its formation has as yet been given. Tin thus modified has a specific gravity of 5.8 while that of the ordinary metal is 7.8, and is so extremely brittle that organ pipes not infrequently crumble to pieces. E. Hjelt inclines to the opinion that rapid cooling and subsequent exposure to low temperatures may favor this peculiar change.

Zinc.

Zinc—Chemically Pure.—Explanation of the difficult solubility of chemically pure zinc. J. Weeren.—Chem. News, 1893, 61.

——— Preparation of.—According to Lescoeur (L'Union pharm., Jan., 1893, 34), zinc, prepared by the double treatment of oxidation by potassium nitrate, and fusion with zinc chloride, is entirely freed from arsenic, antimony, sulphur and phosphorus, while the iron, lead, copper, etc., which it still contains, present ordinarily no inconveniences. On the contrary, the presence of these metals facilitates the action of acids and the disengagement of hydrogen.—Am. Jour. Pharm., 1893, 175.

Zinc—Volumetric Estimation of.—B. C. Hinman. School of Mines Quart., xiv, No. 1.

Zinc as Sulphide—Gravimetric Estimation.—W. F. Lowe.—Jour. Soc. Chem. Indus., xi, 131.

Zinc Cyanide.—Aufschläger finds that a very large proportion of carbon compounds containing nitrogen yield zinc cyanide when they are exposed to the action of zinc dust at a low red heat.—Abstract, Jour. Chem. Soc., 1892, 1164.

Artificial Calamine—Note on.—William Lyon. The author gives a number of reasons in favor of the artificial product.—Phar. Jour. Trans., 1893, 621.

Acicular Basic Zinc Nitrate—Preparation of.—A. Terreil. Bull. Soc., Chim., vii, 553; Jour. Chem. Soc., 1893, 209.

Zincum permanganicum is being used in a one to two per cent. solution as an eye-water or an injection to the urethra.—Merck's Ber., Jan., 1893.

Zinc Sulphide—Phosphorescent.—Charles Henry finds this substance to be unalterable and of use as a photometric standard.—Chem. and Drug., 1892, 603.

Zinc—Valerianate of.—W. A. H. Naylor arrives at results which show that the valerianate of zinc used in medicine is not of uniform composition, and does not meet the official requirements, the precipitated varieties being the worst; further, that the valerianic acid used in the process of manufacture is prepared from an imperfectly purified fusel oil. It is suggested that a more thorough definition of the acid in valerianate of zinc is desirable.—(Brit. Pharm. Conference.) Pharm. Jour. and Trans., 1892, 190.

CHEMISTRY OF THE CARBON COMPOUNDS.

Bibasic Acids—Electrolytic Synthesis of.—Part II. Brown and Walker. —Ann. der Chem., cclxxiv, 41 ; also Trans. Roy. Soc. Edin., xxxvii, 361.

Acetic Acid.

Strength of the Aqueous Solutions of Acetic Acid by means of the Specific Gravity.—E. Nickel overcomes the difficulty of the increase in sp. gr. of such solutions only up to 80 per cent. and then decreasing. This is done by determining the sp. gr. as usual, diluting with water and determining the sp. gr. again. If the sp. gr. rises, the higher value may be assumed to be correct ; but if it falls, the lower.—Chem. Zeit., 1892, 1793.

Acetic Acid from Cellulose and Other Carbohydrates—Production of.—Lignocellulose and Ferric Ferricyanide.—J. F. V. Isaac.—Chem. News, 1892, 39.

Allylacetic Acid—Oxidation of.—Fittig and Urban.—Ann. der Chem., cclxviii, 32–38.

Oximodoacetic Acid.—P. P. Rubtzoff.—Abstract, Jour. Chem. Soc., 1893, 391.

Amide of Eugenol-acetic Acid.—Occurs in the form of crystalline laminæ when crystallized from water, and small needles from alcoholic solution. It melts at 110° C. When applied to the skin in powder, it produces anæsthesia like cocaine and possesses at the same time a powerful antiseptic action, but does not cause irritation.—Pharm. Jour. and Trans., 1892, 263. (See also, Pharm. Centralh., 1892, 441.)

Vinegar.—A. H. Allen and C. G. Moor.—Description of the term vinegar by different authors.—Chem. and Drug., 1893, 829.

Vinegar Manufacture.—J. A. Nettleton.—An account of its manufacture, with some remarks upon the discrimination of genuine from spurious vinegars.—Pharm. Jour. Trans., 1892, 52.

Automatic Manufacture of Vinegar by E. Barbe.—Report by M. Troost on behalf of the Committee of Chemical Arts. Manual labor being dispensed with.—Bull. Soc. Encour. de l'Indus. Nat., July, 1892.

Mashing and Fermenting from the Distillers' Point of View—The Processes of.—W. T. Sykes.—Pharm. Jour. Trans., 1893, 56.

Mineral Acids in Vinegar—Detection of.—Boll. Chim.-farm. The presence of mineral acid in vinegar may be detected by means of a solution of methyl violet. A small quantity of the vinegar is poured into a white plate, and a few drops of solution of methyl violet added. In the presence of nitric acid a blue coloration is produced. With hydrochloric or sulphuric acids a green tint is seen.—Meyer Bros.' Drug., 1893, 92.

Nitric Acid in Vinegar.—Brit. and Col. Drug. Not many samples of vinegar ever come to hand that are contaminated with nitric acid in this country. By the German processes, however, such contamination is frequent. Before buying it would be well to apply chemical tests and the brucine and diphenylamine reagents are recommended. These have recently been reported to be the best.—Ibid.

Angelic and Tiglic Acids.

Angelic and Tiglic Acids.—An Index to the literature from 1842 to 1892. H. P. Talbot.—Technol. Quart., v, Nos. 1 and 2.

Tiglic and Angelic Acids. — Constitution of. Kondakoff.—Abstract, Jour. Chem. Soc., 1892, 1304; 1893, 141.

Geometrical Isomorphism—Remarkable.—Angelic acid, which exists in the free state in the roots of Angelica archangelica, and tiglic acid, found along with the former in Roman oil of cumin, have the same composition, $C_5H_8O_2$, and have been for some time suspected of being isomeric substances. From the remarkable similarity of almost all their reactions, it appeared also that they might possess the same constitutional formula— $CH_3.CH:C\begin{matrix}CH_3\\COOH.\end{matrix}$ At the same time certain slight differences of behavior indicated that the two acids were not identical, and Professor Wislicenus, of Leipzig, felt convinced that they were geometrical- or stereo-isomers, the difference being indicated in the following formula:

$CH_3—C—H$	$H—C—CH_3$
$CH_3—C—COOH$	$CH_3—C—COOH$
Angelic Acid.	Tiglic Acid.

The investigation of the subject by Pickert, a pupil of Wislicenus, led to the conclusion that the bromide addition products of these acids are essentially different. Professor Fittig, of Strassburg, having obtained identical bromine addition products from the two acids, disputed the accuracy of Pickert's results, but Wislicenus has since proved that the apparent discrepancy was mainly due to a difference in the access of light during the operations, owing to the position of the draught cupboards in the laboratories of the respective workers. At Leipzig they are in deep shadow, but at Strassburg they are brightly illuminated in the daytime, and it is shown that the dibromide of angelic acid is only formed in the absence of bright light, direct daylight entirely preventing its formation. Fittig, therefore, had only obtained the relatively more stable dibromide of tiglic acid, which is yielded by both angelic and tiglic acids in a strong light.—Phar. Jour. Trans., 1892, 445; from Annal. der Chem., 272, 99.

Angelic and Tiglic Acids.—Brom-additive Products of.—Wislicenus.—Ann. der. Chem., 272, 1; Jour. Chem. Soc., 1893, 135. Reply by Fittig (See Ann. der. Chem., 273, 127).

Isarabic Acid.

"*Isarabic Acid.*"—Conrad.—Ber. d. Chem. Ges., xxv, 2446.

Isoarabinic Acid—So-called.—Schiebler and Mittelmeier. This acid bears not the slightest resemblance to arabic acid.—Ber. d. Chem. Ges., xxv, 1964.

Benzoic Acid.

Benzoic Acid—Examination of.—O. Schobert.—Pharm. Ztg., No. 49; also ibid., 1892, No. 54. Fischer considers the reaction of Schobert of little worth.

Benzoic Acid—Tannic and Gallic Acids Converted into.—A mixture of ammonia and zinc dust is heated in a flask fitted with cork and tube. As soon as the evolution of hydrogen is sufficiently regular, a warm solution of gallic acid is added little by little. By keeping the temperature at sixty degrees (centigrade) the gallic acid is completely converted after several hours. To extract the acid, the mixture is boiled with potassium carbonate, and the ammonia transformed into carbonate, evaporated to dryness, and taken up with alcohol, which dissolves the potassium carbonate. The same end may be attained by heating gallic acid with zinc and dilute sulphuric acid; and in this case the benzoic acid is obtained in the form of yellowish insoluble particles. These are filtered off and washed free of zinc sulphate; the residue, consisting of benzoic acid and excess of zinc, may be treated with alcohol, or distilled directly. Tannic acid may be converted into benzoic acid under exactly similar conditions.—Pharm. Era, 1892, 172; from Jour. Soc. Chem. Indus.

Benzoic Acid.—This acid from the resin can be distinguished from the acid of other sources by adding resorcin and concentrated sulphuric acid to the alcoholic solution of the acid, when a beautiful red coloration is produced. This reaction, known as a test for aldehydes, would indicate the presence of an aldehyde (very probably vanillin) in the benzoic acid from the resin.—M. Göldner, Pharm. Ztg., 1892, 697.

Amido-Benzoic Acids—Isomerism of the.—O. de Coninck.—Chem. News, 1893, 204; from Compt. rend., April 10, 1893.

——— O. de Coninck.—Compt. rend., March 6, 13, 1893; Abstract, Chem. News, 1893, 145, 158.

Amidobenzoic Acids—Reactions of.—O. de Coninck.—Compt. rend., cxiv, 595 and 758; Jour. Chem. Soc., 1892, 847.

Azoxybenzoic Acids.—Uspensky.—Abstract, Jour. Chem. Soc., 1893, 164.

Azo- and Azoxybenzoic Acids—Action of Phosphorous Pentachloride on.—Ibid., 165.

Diazoamidobenzene and Paradiazoamidotoluene Benzoates and Metanitrobenzoates.—Haller and Guyot.—Ber. d. Chem. Ges., xxiii, 2957; Chem. News, 1893, 120.

Dibromobenzoic Acids.—A. Claus and A. Weil have prepared and characterized four.—Ann. der Chem., 269, 216.

Dichlorobenzoic Acids.—A. Claus and A. Stavenhagen.—Ibid., 224.

Heptanaphthenic (Hexahydrobenzoic) Acid.—V. Markovnikoff.—Ber. d. Chem. Ges., xxv, 3355.

Hexahydrobenzoic Acid.—Aschan.—Ber. d. Chem. Ges., xxv, 3658.

Hydrobenzoic Acid.—O. Aschan re-determines the melting and boiling points.—Ber. d. Chem. Ges., xxv, 886.

Hydrobenzoic Acids.—O. Aschan gives a complete account of his work on the reduction products of benzoic acid, and corrects some of the statements made in earlier papers.—Ann. der Chim., 271, 231.

Methylbenzoic Anilide—Preparation of.—Dupont. Benzoic anilide cannot be methylated by Pictet's method.—Bull. Soc. Chim., vii, 516.

Iodosobenzoic Acid.—V. Meyer and W. Wachter.—Ber. d. Chem. Ges., xxv, 2632.

——— ($C_6H_4(OI)COOH$), is made by the action of fuming nitric acid upon ortho-iodo-benzoic acid, $C_6H_4I,COOH$; purified by recrystallization from water it forms small, pale yellow laminæ, melting at 209° C. with decomposition. With warm, acidulated potassium iodide solution iodine is liberated and the ortho-iodo-benzoic acid regenerated. Medicinal uses are to be found for this new compound.—Pharm. Centralh., 1893, 26.

Orthocyanobenzoic Acid.—Hoogewerff and Van Doop.—Rec. Trav. Chim., xi, 84; Jour. Chem. Soc., 1893, 268.

Orthomethamidobenzoic Acid.—G. Fortmann.—Jour. Chem. Soc., 1893, 414. (Abstract.)

Orthonitrobenzylmetamidobenzoic Acid.—Paal and Fritzweiler.—Ibid., 3590.

Butyric Acid.

α–Amidobutyric Acid—Derivatives of.—Bischoff and Mintz.—Ber. d. Chem. Ges., xxv, 2314.

Anilidoisobutyric Acids.—Ibid., 2326.

Toluidoisobutyric Acids.—Ibid., 2334.

α-and β-Naphthylidoisobutyric Acids, etc.—Derivatives of.—Ibid., 2345.

Carbolic Acid.

See *Phenol.*

Carboxylic Acid.

Acetonedicarboxylic Acid—Action of Acetic Anhydride on.—H. v. Pechmann and F. Neger.—Ann. der Chem., cclxxiii, 186.

Acetondicarboxylate—Action of Nitrous Acid on.—Henry and v. Pechmann.—Ber. d. Chem. Ges., xxvi, 997.

Tetramethylenedicarboxylic Acids.—Markovnikoff.—Abstract, Jour. Chem. Soc., 1892, 1309.

Chebulinic Acid.

Chebulinic Acid.—A contribution to the knowledge of.—W. Adolphi.—Arch der Pharm., 1892, 684.

Chrysophanic Acid.

Chrysophanic Acid.—Grandis finds the melting point to lie between 162° and 187°. The sublimed substance melted at 185–187°, and this was further raised by recrystallization to 190–191°.—Chem. Centralh., 1892, 592.

Cinnamic Acid.

Allocinnamic Acid from Phenylpropiolic Acid—Formation of.—Liebermann and Scholz.—Ber. d. Chem. Ges., xxv, 950; Jour. Chem. Soc., 1892, 848.

Cinnamic and Allocinnamic Acids—Condensation of.—Liebermann and Hartmann.—Ibid.

Cinnamic Acid with Hydrocarbons—Condensation of.—Liebermann and Hartmann.—Ber. d. Chem. Ges., xxv, 2124.

Cinnamic Acid—Oxidation of.—Fittig and Ruer.—Ann. der Chem., 268, 27.

Condensation of Ethyl Cyanacetate and Benzaldehyde: Ethyl α-Cyanocinnamate.—J. T. Carrick.—Abstract, Jour. Chem. Soc., 1892, 1086.

αβ-Dichlorcinnamic Acid (Phenylpropiolic Acid Dichloride).—C. Nissen.—Ber. d. Chem. Ges., xxv, 2664.

Hydrocinnamenylacrylic Acid—Oxidation of.—Fittig and Mayer.—Ann. der Chem., 268, 50.

——— Fittig and Stern.—Ibid., 92.

Cinnamic Acid Dibromides—Optically Active.—Liebermann and Hartmann.—Ber. d. Chem. Ges., xxvi, 829.

——— *Dichlorides.*—Liebermann and Finkenbeiner.—Ibid., 833.

Condensation of the Three Isomeric Methylhydrocinnamic Acids to the Corresponding Methylhydrindones.—Young, in Ber. d. Chem. Ges., xxv, 2102.

α-Phenylcinnamic Acid.—R. Müller.—Ber. d. Chem. Ges., xxvi, 659.

α-Phenylhydrocinnamic Acid.—W. v. Miller and G. Rohde.—Ber. d. Chem. Ges., xxv, 2017.

Citric Acid.

Citric Acid.—This acid may crystallize with or without water of crystallization; the anhydrous acid will crystallize again from cold aqueous solutions in the anhydrous form. By heating aqueous solutions of the hydrated acid to 130° C. the anhydrous acid is obtained; this melts at 153° C. If a crystal of the hydrated acid be placed in a cold saturated solution of the anhydrous acid, there will crystallize from the solution the hydrated acid; the reverse of this, however, has never been accomplished. It has been found that corresponding to the two modifications of the acid there can be prepared the corresponding lead salts. An error which has been introduced in many text books gives the melting point of the hydrated acid at 100° C.; at 70–75° C. the hydrated acid sinters together, due to loss of water of crystallization; further heating produces little change until a temperature of 135–152° C. is attained, when it melts; the wide range, 135–152° C., depends upon the rapidity of heating.—H. Witter (Berichte), Pharm. Centralhalle, 1892, 353.

Citric and Aconitic Acids—Anhydro Derivatives of.—Easterfeld and Sell.—Jour. Chem. Soc., 1892, 1003.

Coumalinic Acid.

Coumalinic Acid.—H. v. Pechmann.—Ann. der Chem., cclxxiii, 164.

Coumalin Rings—Formation of.—Feist, in Ber. d. Chem. Ges., xxvi, 747.

Crotonic Acid.

Crotonic Acids and their Derivatives.—Michael and Schultess.—Abstract, Jour. Chem. Soc., 1893, 132.

Solid Crotonic Acids—Formation of, by the Reduction of α-Isobromo- and α-Isochloro-crotonic Acids.—A. Michael.—Ibid., 133.

——— *Addition of Bromine and Chlorine to.*—Mrs. H. A. Michael.—Ibid.

Crotonic Acid and Isocrotonic Acid—Oxidation of.—Fittig and Kochs,—Ann. der Chem., 268, 7–22.

Ethylcrotonic Acid—Oxidation of.—Fittig and Ruer.—Ibid., 22–27.

Phenylisocrotonic Acid—Oxidation of.—Fittig and Obermüller.—Ann. der Chem., 268, 44.

Phenyl-α-hydroxycrotonic Acid.—Pulvermacher.—Ber. d. Chem. Ges., xxvi, 462.

Elaidic Acid.

See *Oleic Acid.*

Ellagic Acid.

Ellagic Acid.—Goldschmiedt and Jahoda.—Abstract, Jour. Chem. Soc., 1892, 990.

Euxanthic Acid.

Euxanthic Acid and Euxanthone.—Herzig.—Abstract, Jour. Chem. Soc., 1892, 1354.

Furfuralievulinic Acid.

β-Furfurallevulinic Acid: a New Synthesis of Cumarone Derivatives.—Kehrer and Kleberg.—Ber. d. Chem. Ges., xxvi, 345.

Gallic Acid.

Acid Gallic and Tannic in the Organism—On the Behavior of.—Dr. C. F. Mörner has made investigations which completely confirm Stockman's results obtained six years ago, and has further estimated the amount of gallic acid present in the urine after definite doses of gallic and tannic acids. The proportion of gallic acid excreted in the urine largely depends on the amount given in the dose. He finds that after tannic acid has been taken only, very little gallic acid passes into the urine.—Zeits. für Physiol. Chemie. xiv, Heft 4 and 5; reprinted from the Medical Chronicle, July, 1892.

Dibromogallic Acid and its Salts.—Biétrix.—Bull. Soc. Chim., vii, 411; Jour. Chem. Soc., 1893, 269.

Gallic and Dibromogallic Acids—Some Ethers of.—A. Biétrix.—Bull. Soc. Chim., vii, 623; Pharm. Centralh., 1893, 278.

Dibromogallic Acid and the Dibromogallates.—A. Biétrix.—Bull. Soc. Chim. de Paris, 1892, No. 13; Abstract, Chem. News, 1892, 185.

Gallic Acid—Derivatives of.—Biétrix.—Bull. Soc. Chim., vii, 623; Jour. Chem. Soc., 1893, 343.

Gallic and Tannic Acids—Physiological Action of.—Mörner.—Zeitschr. physiol. Chem., 16, 255; Jour. Chem. Soc., 1892, 904.

Gallic Acid into Pyrogallol—Conversion of.—P. Cazeneuve.—Compt. rend., cxiv, 1485.

Fluorescin, Gallein and Aurin.—J. Herzig.—Abstract, Jour. Chem. Soc., 1892, 1319.

Anilide of Gallic Acid.—Schiff in Ann. der Chem., 272, 234.

Gallic Blue or Tannin Indigo—Constitution of.—P. Cazeneuve. This product is the anilide of gallic acid.—Compt. rend., April 24, 1893; Abstract, Chem. News, 1893, 228.

Hydurilic Acid.

Hydurilic Acid—The Functions of.—Preparation of Potassium Hydurilates.—Compt. rend., cxv, No. 22; Chem. News, 1892, 297.

Lactic Acid.

Lactic Acid—Peculiar Color Change in Titrating.—W. L. Scoville no-

ticed that upon adding a normal soda solution to a known quantity of hot diluted lactic acid, using phenolphthalein, litmus, turmeric and cochineal as indicators, the pink color, indicating an alkaline reaction, was obtained as usual, but quickly disappeared upon standing. This is due to a reaction between the acid and water.

The commercial acid consists of a mixture of true lactic acid and *lactic anhydride*—the latter being formed by heat of evaporation, even in presence of the small amounts of water present.

This anhydride is formed by elimination of one molecule of water from two molecules of acid, and is called *lactic anhydride, lactolactic acid.*

$$2HC_3H_5O_3—H_2O=HC_3H_5O_3,C_3H_4O_2.$$

It partakes of the nature of an acid, an alcohol, and an ethereal salt.

This anhydride reabsorbs water very slowly in the cold, more rapidly when heated, and becomes true lactic acid.

The pharmacopœial lactic acid consists of about 75 per cent. free lactic acid, and anhydride representing nearly or quite 15 per cent. more, making it equal to an 89 to 91 per cent. acid in saturating power. The full saturating power may be quickly ascertained by weighing out 4.5 Gm. of the acid, diluting with 20 to 25 C.c. of water, then an excess, or about 50 C.c. of normal potassa or soda is drawn in, after addition of a drop or two of phenolphtalein solution. After boiling the mixture for fifteen to twenty minutes the excess of alkali is ascertained by normal oxalic or sulphuric acid. The number of C.c. of alkali required multiplied by two gives the percentage strength of the lactic acid.—Amer. Drug. and Pharm. Record, 1893, 384.

Lactic Acid—Optically Active and Inactive.—T. Purdie and J. W. Walker have separated these two forms of acid by the application of Pasteur's method.—Pharm. Jour. and Trans., 1892, 261; Chem. News, 1892, lxvi, 33.

Resolution of Lactic Acid into its Optically Active Components.—T. Purdie and J. W. Walker.—Jour. Chem. Soc., 1892, 754.

Lactonic Acid.

Lactonic Acids, Lactones, and Unsaturated Acids.—R. Fittig.—Ann. der Chem., 268, 1–7.

Some New ε-Lactones.—Fittig and Christ.—Ibid., 110–129.

Lapachic Acid.

"Lapachic Acid" (Lapachol) and its Derivatives.—The Constitution of. S. C. Hooker.—Jour. Chem. Soc., 1892, 611.

Linoleic Acid.

Linoleic Acid in some Animal Fats—Presence of.—D. Kurbatoff.—Abstract, Jour. Chem. Soc., 1893, 392.

Malic Acid.

Malic Acid—Homologues of.—Michael and Tissot.—Jour. f. prakt. Chem., 46, 285.

Malic and Fumaric Acids with Aromatic Amines—Compounds of.—E. Giustiniani.—Gaz., xxiii, 168; Jour. Chem. Soc., 1893, 264.

Maleic Acid.

Maleic into Fumaric Acid—Transformation of.—Tanatar.—Abstract, Jour. Chem. Soc., 1892, 1304, 1305.

Mercapturic Acid.

Mercapturic Acid—Oxidation Products of.—G. Konig.—Abstract, Jour. Chem. Soc., 1892, 1090.

Oleic Acid.

Oleic Acid—Examination of.—The purity of the commercial acid is ascertained by Dr. Hager by (1) the specific gravity 0.895–0.915; (2) solubility in 80 per cent. alcohol, and (3) perfect solubility in benzin (presence of water and alcohol causing a turbidity). The second test is for the detection of hydrocarbons; Th. Salzer states in this test while the hydrocarbons themselves are not soluble in 85 per cent. alcohol, considerable quantities will dissolve in the presence of oleic acid; he has found an addition of 25 per cent. rosin oil to oleic acid to answer the above requirements, and therefore advises the use of a more dilute alcohol, sp. gr. 0.860. In addition to 5 C.c. alcohol of this specific gravity, there is produced a permanent turbidity on addition of 6 C.c. pure olein, 5 C.c. olein containing 5 per cent. rosin, 4 C.c. olein with 10 per cent., 3 C.c. olein with 20 per cent. rosin oil. There is produced a turbidity on adding a small quantity of these adulterated oleins to 5 C.c. of the alcohol, but this disappears upon adding more.—Pharm. Centralhalle, 1892, 290.

Oleic and Elaidic Acids.—A. Saytzeff. Elaidic acid, like oleic acid, yields as its main product not oleic acid, but an isomer, isoleic acid. Its stereo-chemical formula is probably:

$$\begin{array}{l} CH_3—(CH_2)_{14}—C—H \\ \qquad\qquad\qquad\quad \| \\ \qquad\qquad\qquad\quad H—C—COOH \end{array}$$

—Jour. of prakt. Chem., xlv; Chem. News, 1892, 98.

Oxalic Acid.

Oxalic Acid—Decomposition of Solutions of.—Gigli, Apoth. Zeit., 1893, 583.

Oxalic Acid—Anhydrous.—W. W. Fisher reports that he has succeeded in obtaining some remarkably fine crystals of anhydrous oxalic acid. The

usual method of obtaining the crystallized anhydrous acid is to dissolve the ordinary crystals, containing two molecules of water, in 10 or 12 times their weight of sulphuric acid, and cooling the solution. These crystals are, however, very small, but if allowed to stand for a considerable time, a much finer crop of crystals is secured. A similar result was obtained with concentrated nitric acid, the crystals in one instance being nearly three quarters of an inch across. These crystals are rhombic octahedrons, and a portion had sublimed on to the opposite side of the tube apparently without decomposition.—Drug. Circ., 1892, 36.

Papaverinic Acid.

Papaverinic Acid.—Goldschmiedt and Schranzhofer.—Abstract, Jour. Chem. Soc., 1893, 180.

Phthalic Acid.

Phthalic Acid—Reduction Products of.—Constitution of Benzene.—A. v. Baeyer.—Ann. der Chem., 269, 145.

Proprionic Acid.

α-Amidoproprionic Acid—Derivatives of.—Bischoff and Hausdörfer.—Ber. d. Chem. Ges., xxv, 2298.

Salicylic Acid.

Salicylic Acid from Benzoic Acid—Separation of.—By Miss J. Schaff. A few mixtures, each consisting of 0.25 Gm. of salicylic and 0.25 Gm. of benzoic acid, were dissolved in a sufficiency of hot water, and the liquids were then allowed to cool. The salicylic acid was now precipitated by excess of bromine water, but the question had to be decided whether it was precipitated as the mono-, di-, or tri-bromo compound. The author, therefore, took 0.25 Gm. of the bromo-salicylic acid, and estimated the bromine by Fresenius' lime method. The nitric acid used was free from chlorine, but the lime was not, so a check had to be made. Allowing for the small quantity of chlorine in the lime, the results in four experiments were, respectively: 0.305, 0.315, 0.319 and 0.314 Gm. of AgBr. Theory requires 0.215 Gm. for the mono-compound, 0.316 Gm. for the dicompound, and 0.374 for the tri-compound; so it follows that the precipitate consisted of the di-compound.

Another question now arose whether the precipitate was sufficiently insoluble in water, and also whether the precipitation was complete. To solve this question 0.25 Gm. of salicylic acid was dissolved in water and precipitated with bromine water. Having found that the bromo-compound is very readily soluble in chloroform, J. Schaff concentrated the filtrate at a temperature of 30° and agitated the liquid with chloroform, which on evaporation did not yield the smallest residue, showing that all the

salicylic acid had been precipitated. The precipitated dibromo-salicylic acids were dried in a desiccator and afterwards weighed. The weights were, respectively: 0.56, 0.556, 0.551 and 0.553 Gm., theory requiring 0.536 Gm.

In order to directly estimate the benzoic acid, the filtrates were rendered faintly alkaline with sodium carbonate, and evaporated to a small bulk on the water-bath to expel the excess of bromine. The residues were then put into separatory funnels, acidified with hydrochloric acid, and shaken out with chloroform. This was filtered through a dry filter and allowed to spontaneously evaporate in weighed glass dishes. The results were, respectively: 0.272, 0.261, 0.237 and 0.232 Gm. of benzoic acid, instead of 0.250 Gm.—Ned. Tydschr. v. Pharmacie, etc., July, 1892; Chem. News, vol. 66, p. 43; Am. Jour. Pharm., 1892, 442.

Salicylic Acid—Manufacture of.—In the manufacture of salicylic acid the distillation of the crude acid with superheated steam is attended by considerable loss. P. W. Hofmann has patented a process by which the distillation becomes unnecessary. To the crude lye is added some stannous chloride solution; this precipitates a dark oily mass, containing the objectionable impurities, while the supernatant liquid is as clear as water; the addition of hydrochloric acid then causes the precipitation of pure salicylic acid, which is freed from hydrochloric acid by washing and the use of centrifugals.—Pharm. Centralh., 1892, 412.

Salicylic Acid in Presence of Phenols.—This acid in presence of phenols cannot be colorimetrically estimated in aqueous solutions; in alcoholic solution, however, only the former reacts with ferric chloride. A. Fagans furnishes the following working method: The liquid to be examined is acidified and extracted with ether; the ethereal solutions are evaporated, and the residue dissolved in 25–30 C.c. absolute alcohol placed into a graduated tube of 12–16 mm. diameter; into a similar tube is placed an equal quantity of a 0.02 per cent. solution of salicylic acid in absolute alcohol. To both solutions a 5 per cent. alcoholic ferric chloride solution is added until the maximum intensity of color results; by adding alcohol to one of the tubes until the colors are of the same intensity, and then noting the volume of each solution, the data are obtained for calculating the salicylic acid. It was found possible to make estimations even if the phenols were present in the proportion of 800 parts to one part salicylic acid.—Chem. Zeit., 1893, 69.

Salicylic Acid—Solubility of.—The employment of salicylic acid to obviate the inconveniences and accidents in surgery and obstetrics due to the use of mercuric chloride, is unsatisfactory because of its sparing solubility. Carcano and Cesaris (Boll. farm., through Jour. de Pharm. d'Anvers, Feb., 1893, p. 55) propose to associate boric acid with salicylic acid, in the following proportion: boric acid, 12 p.; salicylic acid, 6 p.,

and water, 1,000 p. This boro-salicylic solution has the double advantage of being non-poisonous, and acting as a microbicide.—Am. Jour. Pharm., 1893, 173.

——— Action of Heat on.—Graebe and Eichengrün. When salicylic acid is heated at 195–220°, it is to a great extent converted into phenyl salicylate; if the product is now distilled, a considerable quantity of xanthone is formed.—Ann. der Chem., 269, 323.

Anlidosalicylic Acid.—R. Dierbach.—Ann. der Chem., 273, 117.

Salicylacetic Acid.—Pharm. Centralh., 1893, 41. Process of manufacture.

Thiosalicylic Acid.—C. Graebe in Pharm. Centralh., 1892, 500.

Stearic Acid.

Trihydroxystearic Acids prepared from Ricinoleic Acid and from Ricinelaidic Acid—Stereochemistry of.—K. Mangold. Abstract, Jour. Chem. Soc., 1892, 1304.

Succinic Acid.

Succinic Acid, according to Pasteur, is produced in the alcoholic fermentation in a definite ratio to the glycerin (1 : 5), other investigators reporting different results. Mr. Rau studied the fermentation of various sugars at 15°, 25°, and 35° C., in the absence and presence of air, and as caused by different kinds of yeast. His conclusions are: Low temperatures will not decrease the quantity of succinic acid, but will decrease the quantity of glycerin; the addition of nourishment to the fermenting liquid does not increase the yield of succinic acid, but strongly increases the yield of glycerin; the presence or absence of air during the fermentation is without influence upon both glycerin and succinic acids; an energetic action of the yeast-cells will generally augment the formation of succinic acid. Succinic acid independently of the glycerin formation is a normal product of the alcoholic fermentation.—(Arch. f. Hygien.) Apoth. Zeit., 1892, 411.

Succinic Acid.—A. Rau gives a method for its determination in an alcoholic liquid.—Chem. Centr., 1892, 155; Jour. Chem. Soc., 1893, 10.

——— Amido- and Anilido- Derivatives of.—Hell and Poliakoff.—Ber. d. Chem. Ges., xxv, 640; Jour. Chem. Soc., 1892, 819.

Dibromsuccinic Acids.—Lossen.—Ann. der Chem., 272, 127.

Ethyl Dibromsuccinate—Action of Sodium Ethoxide on.—Michael and H. C. C. Maisch.—Jour. f. prakt. Chem., 46, 233.

Ethoxysuccinic Acid—Optically Active.—Purdie and Walker.—Ibid., 229.

Methoxysuccinic Acid.—Resolution of, into its Optically Active Components.—Purdie and Marshall.—Jour. Chem. Soc., 1893, 217.

Tannic Acid.

Tannin—Determination of.—Klinger and Bujard come to the same conclusion concerning the Gantler process as do Von Schroeder and Pässler.—Zeitschr f. angew Chem., 1891, 513; Zeitschr. f. anal. Chem., 1892, 468.

——— G. Fleury (Jour. Phar. Chim., 1892, 499, proposes to use egg albumen for estimating tannin. The hard-boiled egg albumen is dried at a moderate temperature and powdered. This is washed with dilute alcohol (10 per cent.), very slightly acidulated with tartaric acid to saturate the alkali. The albumen is again dried and kept in a well-stoppered bottle. The method of operation is as follows:

Albumen powder, equal to seven or eight times the quantity of tannin which is supposed to be present, is added to the liquid in a flat dish. The dish is then set aside for forty-eight hours, stirring occasionally; the liquid must during this time be acid and not alkaline. The end of the reaction is attained when the liquid does not give a color with perchloride of iron. The powder is then collected on a filter, is washed with a very dilute alcohol, and is then dried at 100° C. At the same time the amount of water in a sample of the albumen from the stock is determined, the difference between the two then giving the amount of tannin present. Gallotannic acid cannot be estimated according to this process, because the absorption by the albumen is incomplete and very slow. In testing it is necessary to bear in mind that gallic acid is not absorbed by the albumen, and consequently still gives its reaction with ferric chloride.

——— *According to Gantler's Process.*—Zeit. f. anal. Chem.; Chem. News, 1892, 182.

Tanning Materials—Plants Capable of Yielding.—By F. E. Mafat. *Algarobilla* (Prosopsis); *Alder* [(Betula alnus), Linn. Alnus glutinosa, A. incana, A. firma]; "*Arbousier*" (Arbutus unedo); "*Arielle-myrtille*" (Vaccinium myrtillus, Linn.); *Alcornoque* (Bowdichia vergilioides, Humboldt; *Acacia* (Acacia); *Andromeda; Birch; Bennet* (Geum urbanum, Linn.); *Bistort* (Polygonum bistorta); "*Behen rouge*" (Statice latifolia, Smith); "*Bois dour*" (Inga vera); *Bauhinia* (B. variegata); *Bearberry* (Arbutus uva-ursi, Linn.); *Oak* (Quercus, many different species); *Chestnut* (Castanea vesca); *Cornelian Cherry* (Cornus mascula, dogwood); *Carob* (Ceratonia siliqua, Linn.); *Carob of Judea* (Pistacia Terebinthus, Linn.); (*Conocarpus arborea* and *C. racemosa*); *Catechu* (Acacia catechu, Areca catechu, Uncaria gambier); *Canaigre* (Rumex hymenosephalum, Linn.) *Paraguay Acacia* (Curupay); *Divi divi* (Caesalpinia coriaria); *Eucalyptus* (E. resinifera); *Fustic, young* (Rhus Cotinus, Linn.); *Spiræa* (S. filipendula, Linn.); *Strawberry* (Fragraria vesca, Linn.); *Pomegranate* (Punica Granatum); "*Gonakie*" (Acacia Adansonii); *Kino* [Dipterocarpus erinaceous (Africa), Butea frondosa and B. superba (N. India), Pterocarpus marsupium (India), Coccoloba uvifera

(Jamaica), Rhizophora Mangle or Mangrove (Mexico)]; *Mastic* (Pistacia lentiscus, Linn.); *Mimosa* (Acacia, many varieties); *Myrobalans* (M. terminalia); *Galls* (European and Asiastic); *Osier* (Salix viminalis); *Quebracho* (Loxopterygium Lurentzii, Aspidosperma Quebracho); *Red Rhatany* (Krameria triandra); *Pine* (Pinus picea, P. canadensis, P. abies and P. Aleppensis); *Larch* (Larix Europœa); *Sumac* (Rhus coriaria and others); *Tormentilla reptans* and *T. erecta; Willow* (Salix); *Mountain Ash* (Pyrus aucuparia); *Valonia* [(Quercus Ægilops) (Chamandra, Chamandina, Kabdista and Chondra)]. The author considers the origin, habitat and amount of tannin yielded by the above named plants. —Abstract, in Jour. Soc. Chem. Ind., July, 1892; Pharm. Jour. Trans., 1892, Aug.; Am. Jour. Pharm., 1892, 526–532. (Also Phar. Jour. Trans., 1893, 886.)

Tannin Receptacles of the Leguminosæ.—P. Baccarini.—Pharm. Jour. Trans., 1893, 830; from Malpighia, 1893, Vol. vi.

Mangrove Tannin.—Henry Trimble. Account of, with illustration of a grove of Rhizophora Mangle.—Contr. Bot. Lab., Univ. Penn., 1, 50.

——— Henry Trimble. The tannin obtained by the author was in light reddish-yellow porous masses, completely and readily soluble in water, alcohol, and commercial ether. It was partly precipitated from its aqueous solution by saturation with common salt. That not precipitated was removed by agitation with acetic ether, and, although lighter in color, it was found to be identical with the darker portion precipitated by the salt.

The following are the reactions of the mangrove-tannin, in 1 per cent. solution, with the usual reagents. There is added for comparison the behavior of a similar solution of gallo-tannic acid.

REAGENT.	MANGROVE-TANNIN.	GALLO-TANNIC ACID.
Sulphuric acid, (1 to 9 of water),	Red deposit on cooling.	No change.
Bromine water,	Yellow ppt.	No ppt.
Ferric chloride and	Dirty green ppt.	Blue-black ppt.
Ammonium hydrate,	Purple ppt.	Purple ppt.
Tartar emetic, and	No ppt.	White ppt.
Ammonium chloride,	No ppt.	White ppt.
Calcium hydrate,	Pink ppt. Red on surface.	White ppt. Turning blue.
Concentrated sulphuric acid,	Deep-red color.	Yellow color.
Lead nitrate,	No ppt.	White ppt.
Cobalt acetate,	Faint cloudiness.	Flesh-colored ppt.
Uranium acetate,	Red-brown color and ppt.	Crimson color.
Potassium bichromate,	Brown ppt.	Brown ppt.
Ferric acetate,	Olive-green color and ppt.	Blue-black ppt.

These reactions agree closely with those given by Procter for the tannin of mimosa or wattle bark.

A further examination of the tannin failed to reveal the presence of sugar. It is a catechol tannin. By hydrolysis the presence of gallic and ellagic acids and phlobaphenes is indicated. Its formula is about $C_{25}H_{25}O_{11}$. The conclusion naturally reached by this investigation is, that we have in mangrove a tannin which is identical with that from horse-chestnut, rhatany, and tormentil, and possibly also with that from mimosa of wattle bark.—Phar. Jour. Trans., 1893, 627.

Tea Plant—The Tannin of, and the Fat of Coffee Seeds.—F. Fretzel. Salzbach i O, 1892, 21 p., J. E. von Seittel, Pamph.

Tartaric Acid.

Tartaric Acid and its Salts.—Specific Rotatory Power of.—A. A. Kanonnikoff.—Abstract, Jour. Chem. Soc., 1892, 1308.

Tartaric and Racemic Acids.—Aqueous Solutions of.—Marchlewski.—Ber. d. Chem. Ges., xxv, 1556.

Tartrotartaric Acid.—M. E. Mulder.—Abstract, Jour. Chem. Soc., 1892, 965.

Tartaric Acid—Synthesis of.—P. Genvresse (Compt. rend., cxiv, 555), treated glyoxylic acid, $COH.CO_2H$, with zinc powder and acetic acid, heating finally on the water-bath, whereby it was converted into racemic acid.

——— *from Starch.*—Starch or dextrin is acted upon by freshly prepared nitric acid.—Pharm. Era, 1892, 328.

——— *The Formula of Ordinary.*—A reply to Friedel and Le Bel by A. Colson.—Bull. Soc. Chim. de Paris; Chem. News, 1893, 168.

Commercial Tartaric and Citric Acids—Lead in.—Buchet (L'Union Pharm., 1892, 203), found in one kilogram of commercial tartaric acid from 0.011 to 0.071 Gm. of metallic lead, and from 0.017 to 0.363 Gm. of lead salts. The method of analysis used is as follows: 200 Gm. of tartaric acid are dissolved in three times their weight of distilled water with a slight excess of ammonia to insure the solution of sulphate of lead. The solution is then set aside for twenty-four hours, the liquid decanted, and the residue collected on a small filter. The filter and contents are treated with nitric acid; to this solution sulphuric acid and twice its volume of alcohol are added. The precipitate of sulphate of lead is washed with alcohol, collected on a filter, and weighed after calcination. This gives the quantity of metallic lead. To estimate the amount in combination, the ammoniacal liquid from above is used. The liquid is slightly acidulated with hydrochloric acid and a current of hydrogen sulphide passed through it. It is then set aside for twelve hours, the sulphide collected, and this dissolved in dilute nitric acid. The remainder of the operation is the same as above.—Am. Jour. Pharm., 1892, 405. (Also, Editorial in Chem. and Drug., 1892, 236.)

——— R. Warrington. The author describes two colorimetric methods: 1. The glycerin method. 2. The ammonium sulphide method.—Pharm. Jour. Trans., 1893, 687 and 748.

Pyrotartaric Acid—Ethereal Salts of.—Braunschweig.—Jour. prakt. Chem., 47, 274; Jour. Chem. Soc., 1893, 307.

Alkyl Tartrates.—P. Freundler.—Compt. rend., cxv, 509.

Valeric Acid.

Phenyldibromovaleric Acid.—Fittig and Stern.—Ann. der Chem., 1892, 268, 86.

ALKALOIDS, GLUCOSIDES, ETC.

Alkaloids—Volumetric Determination of.—L. Barthe finds that the following alkaloids are unaffected by phenolphthalein: Quinine, cinchonine, cinchonamine, cinchonidine, quinidine, morphine, codeine, cocaine, aconitine (amorphous or crystalline), strychnine, brucine, veratrine, pilocarpine, duboisine, sparteine. Combining this observation with the well-known property of the vegetable bases, turning red litmus blue, he proposes the following method for the determination of the alkaloids above mentioned, and also the acids with which they may be combined:

Determination of the Acid.—We introduce into a beaker of Bohemian glass $\frac{1}{100}$ part of an equivalent of the alkaloid or of a salt of the alkaloid, adding 10 C.c. of decinormal sulphuric acid in case of a salt, or 20 C.c. in case of a free alkaloid. We add 20 C.c. of neutral alcohol of 90 per cent., and three or four drops of an alcoholic solution of phenolphthalein. All the salts of the alkaloids dissolve in this acid alcoholic liquid. We then pour in decinormal potassa until there appears a faint rose-colored tint of phenolphthalein. The number of C.c. of decinormal potassa used expresses all the acid, free or combined, existing in the mixture. The rose-tint of phenolphthalein appears only when all the alkaloid is in the free state in the liquid; as a transparent solution if the alkaloid is soluble in a weak, neutral alcohol, or as a precipitate if it is insoluble. We have thus a mixture indifferent to phenolphthalein, but alkaline to litmus in consequence of the liberation of the alkaloid.

Determination of the Alkaloid.—Into a second beaker of Bohemian glass we introduce $\frac{1}{100}$ of an equivalent of the alkaloid, or of a salt of an alkaloid, with 10 or 20 C.c. of decinormal sulphuric acid, and a few drops of a sensitive tincture of litmus. The color is then rendered blue again by means of decinormal potassa. The number of C.c. of the alkaline liquid employed in this second saturation represents merely the free acid. If this number is subtracted from the figure which in the foregoing operation measures the entire acid, it expresses exactly the quantity of sulphuric acid combined with the alkaloid in the state of a basic salt, and consequently the weight of the alkaloid itself. It is, in fact, sufficient to multiply the

remainder from the subtraction by $\frac{1}{10000}$ of the equivalent of the alkaloid in question. The factors are evidently:

For anhydrous quinine	0.0324
For cinchonine	0.0294
For codeine (H_2O)	0.0317
For morphine (H_2O)	0.0303

—Compt. rend., vol. cxv, p. 512; Chem. News, Nov. 4, 1892, p. 223; Am. Jour. Pharm., 1892, 638.

——— A. H. Allen protests against the above paper of Barthe.—Chem. News, 1892, 259.

——— P. C. Plugge claims priority against L. Barthe.—Compt. rend., Dec. 5, 1892, 1012.

——— F. Leger. Claims priority on the application of phenolphthalein to volumetric analysis.—Compt. rend., Nov. 7, 1892, 732; also Jour. Pharm. Chem., 1893, 52.

——— L. Barthe admits that Leger has the prior claim as originator of a volumetric process for the estimation of alkaloids, based on the use of phenolphthalein.—Compt. rend., cxv, 1085.

Alkaloids—The Constitution of.—A. R. L. Dohme. Also a glance at the history of alkaloids.—Pharm. Rev., 1892, 202.

——— *The Chemistry of.*—E. T. Parry. A paper upon the alkaloids. 1. The amines, referring especially to the trimethylamine derivatives. 2. Uric acid group, including xanthine, caffeine and theobromine. 3. Ptomaines and the allied leucomaines. 4. True alkaloids or pyridine group.—Phar. Jour. Trans., 1892, 353.

Alkaloids on Plants—Influence of.—H. de Varigny concludes that atropine acts as a poison to plants just as it does to animals.—Chem. and Drug., 1893, 732.

The Alkaloids and their Uses in Therapeutics.—Lecture by G. Bardet, translated in Nat. Drug., 1892, 221 and 32.

Natural Alkaloids—Synthesis of.—L. Bouveault (Revue Générale des Sciences, 1891, No. 23, p. 787,) reviews this subject, discussing the work of Seguin and Derosne, Sertuerner, Pelletier and Caventou, Gautier, Gmelin, Strecker, Liebreich, Selmi, Étard and Brieger, as regards alkaloids, toxines, and ptomaines. The labor toward synthesis of Liebig, Wohler, Berthelot, Würtz, Baeyer, and Fischer receives recognition. As instances of partial synthesis are cited creatinine, codeine; of total synthesis, muscarine, betaine, xanthine, conicine. The large amount of work, dating backward only ten years, seems incredible, and when we consider the significance of this subject, we realize that we are but upon the threshold of important chemical results.

Average Yields of Alkaloids.—M. Adrian finds that on a manufacturing

scale he obtains the following yields of alkaloids from the respective drugs:

250 to 350 grams of atropine from 100 kilos. of commercial belladonna root containing 12 to 20 per cent. of inert matter (moisture, stem, etc.).

50 to 55 grams of atropine from 100 kilos. of fresh belladonna leaves and branches.

11 to 12 grams of atropine from 100 kilos. of fresh belladonna stems and leaf-stems.

32 to 34 grams of atropine from 100 kilos. of fresh belladonna herb (leaf and stem together).

80 to 100 grams of amorphous aconitine, and 100 to 150 grams of crystallized aconitine, from 100 kilos. of commercial aconite root containing 15 per cent. of foreign matter (moisture, etc.), when treated with cold alcohol. A total of 150 to 180 grams amorphous aconitine is obtained when digestion with alcohol is done on the water-bath.

500 to 600 grams of pilocarpine nitrate from 100 kilos. of jaborandi leaves.

800 to 1,700 grams of sparteine sulphate from 100 kilos. of dried broom.

120 to 180 grams of physostigmine sulphate from 100 kilos. of Calabar bean.

Some commercial jaborandi leaves yield only 100 grams of pilocarpine nitrate for 100 kilos.

We take these figures from an article on the therapeutic uses of alkaloids, by Dr. G. Bardet, in Nouv. Rem., 1892, 244; Bull. Pharm., 1892, 486.

Poisons—Action of Earth upon.—The action of the earth on poisons has been investigated by F. Falk and R. Otto (Berlin. Vierteljahrsschrif. f. gerichtt Medicin und öffentl. Sanitätswesen), in which they have found that such alkaloidal poisons as strychnine and nicotine entirely lose toxic properties when their solutions are passed through sandy soil or earth. They attribute their change to a process of nitrification, whereby the molecular composition of the alkaloids is altered.—Meyer Bros.' Drug., 1892, 229.

Schiff's Bases.—W. v. Miller, J. Plöchl and others.—Abstract, Jour. Chem. Soc., 1892, 1189; from Ber. d. Chem. Ges., xxv, 2020.

Ptomaines and Alkaloids.—Similarity in the reaction of certain ptomaines and some alkaloids.—Hogouneng, in Rép. de Pharm., 1893, 64.

Aconite Alkaloids.

Aconitine.—By A. Ehrenberg and C. Purfuerst. The aconitine was purified from a large commercial sample by recrystallization from ether, only the middle fraction being used. The pure alkaloid melts at 193–194°

(Dunstan and Ince, 1891, m. p. 181.5°), but the presence of a very small quantity of a decomposition product, which coats the crystals like a varnish and therefore escapes detection, lowers the melting point by 10° and more; for this reason the purification of aconitine by converting it into a salt and decomposing this by an alkali is inadmissible. The authors' formula for aconitine is $C_{32}H_{43}NO_{11}$; Wright and Luff give $C_{33}H_{43}NO_{12}$ (1878); Dunstan and Umney, $C_{33}H_{45}NO_{12}$ (1892). Determinations of methoxyl by Zeisel's method showed 9.92, 9.98 and 10.13 per cent. of methyl as methoxyl; the elimination of four methyl groups from the above formula would give 9.93 per cent.

When hydrolized by alcoholic potash, or by water, at 140–150°, aconitine yields a new base, methyl alcohol, benzoic acid and another acid (compare authors quoted). When it is heated with water in a reflux apparatus until it has all dissolved, picroaconitine and napelline are produced, and crystallize from the solution as benzoates; they may be approximately separated by treatment with dilute sulphuric acid, washing with ether to extract the liberated benzoic acid, adding sodium carbonate until there is a slight precipitate and again shaking with ether, which extracts the napelline; the picroaconitine is obtained by digesting the slightly alkaline solid residue with ether. The picroaconitine, $C_{25}H_{39}NO_{11}$, is probably formed from 1 mol. of aconitine by the absorption of 1 mol. of water and elimination of 1 mol. of benzoic acid, and the napelline, $C_{24}H_{37}NO_{10}$, from 1 mol. of picroaconitine, by the absorption of 1 mol. of water and elimination of 1 mol. of methyl alcohol. The mother liquors from the picroaconitine and napelline benzoates contain aconine, $C_{22}H_{35}NO_9$, and acetic acid; this points to the formation of 1 mol. of aconine from 1 mol. of napelline by the absorption of 1 mol. of water and elimination of 1 mol. of acetic acid.

When aconine is distilled with barium hydroxide, paraffin hydrocarbons, methylamine, and an oily compound which boils at about 245° and has an odor of quinoline, are obtained. This matter is being further investigated.

The so-called amorphous aconitine of commerce is a variable mixture of aconitine, picroaconitine and napelline.—J. pr. Chem. (2), 45, 604; Jour. Chem. Soc., 1892, 1254; Am. Jour. Pharm., 1892, 637.

Aconitine—The Composition of Some Commercial Specimens.—The results of W. R. Dunstan and F. H. Carr are as follows:

(1) *Aconitine, Pure (German).*—A yellowish-white, amorphous powder which melted indefinitely near 107°. When dissolved in dilute hydrobromic acid, it furnished a highly colored solution. From this liquid, pure isaconitine salt was eventually obtained, in amount corresponding with the presence of about 20 per cent. of the alkaloid in the original substance. Aconitine was present only in relatively small quantity, and it was not found possible to isolate it. Aconine, and apparently homisaconitine, were also present.

(2) *Aconitine, Crystallized (French).*—A white, crystalline powder melting near 187°. It dissolved completely in cold water, and proved to be the nitrate of an alkaloid, not the base itself. The alkaloid was regenerated and dealt with in the usual manner. A considerable quantity of pure aconitine hydrobromide was obtained, and from this, pure crystalline aconitine (m. p. 188° to 189°) was prepared. A smaller quantity of isaconitine hydrochloride was isolated, whilst other amorphous bases (aconine, homisaconitine, etc.) were observed in small quantity. The nitrate, of which the original substance was composed, contained about 70 per cent. of aconitine salt.

(3) *Aconitine, Pure (English).*—A yellowish-white, amorphous substance, melting indistinctly near 88°. Its solution in dilute hydrobromic acid was highly colored. A considerable quantity of alkaloid soluble in ether was isolated; this was chiefly isaconitine. No crystalline aconitine salt could be isolated from the small quantity of material at our disposal. The physiological action of the acid solution indicated that a small quantity of this alkaloid was present, but the specimen was chiefly composed of amorphous bases.

(4) *Aconitine, Pure (German).*—A dirty white amorphous powder, melting at 111°. The solution in dilute acid was yellow. No crystalline aconitine salt could be isolated, although a small quantity of the alkaloid was detected by its physiological action. Some isaconitine was obtained in addition to other amorphous alkaloids, including aconine.

(5) *Aconitine, Crystallized (German).*—A collection of small white crystals melting at 170°. It yielded a considerable quantity of crystalline aconitine hydrobromide, from which the pure crystalline base, melting at 188–189°, was regenerated. Isaconitine was also obtained. Rather more than two-thirds of the original material was aconitine.

(6) *Napelline (German).*—Napelline was the name given by Hübschmann to what seems to have been a mixture of the amorphous alkaloids of Aconitum Napellus, a brown amorphous powder melting near 120°, and not completely soluble in dilute acid. The highly colored solution furnished some isaconitine. It also contained aconitine and considerable quantities of amorphous alkaloid, partly aconine. The original substance was probably the total alkaloids of A. Napellus, from which some of the aconitine had been removed.

(7) *Aconitine, Pure (English).*—A yellowish, amorphous powder melting at 85°. It partially dissolved in dilute acids, forming a colored solution from which no crystalline aconitine salt could be isolated, although the presence of a small quantity of this alkaloid was detected by its physiological action. About two-thirds of the alkaloid consisted of amorphous alkaloids, the remainder being resinous substances, apparently non-alkaloidal, and a little aconine.

(8) *Aconitine from A. Napellus (German).*—A yellow, amorphous powder, melting between 105° and 110°. Its solution in dilute acid was colored. A considerable quantity of crystalline isaconitine salt was separated, but the amount of aconitine was too small to admit of isolation. More than one-fifth of the original substance turned out to be isaconitine, the remainder being other amorphous bases, a small quantity of aconitine, and some non-alkaloidal substance.

(9) *Aconitine (English).*—A nearly white, amorphous powder, dissolving in dilute acid, forming a dark colored solution. The substance was chiefly composed of amorphous bases with very little aconitine.

(10) *Aconitine Muriate (German).*—A yellow, non-crystalline powder, melting indistinctly at 86°. Its solution in water was highly colored, and produced only a feebly tingling sensation on the tongue. It was chiefly isaconitine hydrochloride, contaminated with the hydrochlorides of other amorphous alkaloids, and with a trace of aconitine hydrochloride.

(11) *Aconitine Sulphate (German).*—A reddish, crystalline powder, melting indefinitely below 128°. Its aqueous solution was red. The alkaloid was regenerated, and was proved to be chiefly isacontine with a little aconitine.

(12) *Aconitine Nitrate (German).*—A dark yellow, amorphous substance, melting near 62°. The aqueous solution was yellow. It furnished no crystalline alkaloid, but the existence in it of a small quantity of aconitine was revealed by its physiological action. Some isaconitine was isolated, but it was contaminated with other amorphous alkaloids.

(13) *Aconitine, Pure, from Aconitum Napellus (English).*—A yellowish-white, crystalline powder, melting at 186–187°. It dissolved completely in dilute acid, forming a yellow solution. A large quantity of pure aconitine was isolated, together with a small quantity (about 3 per cent.) of isaconitine.

(14) *Aconitine, Pure, Crystallized, from Aconitum Napellus (German).*—A collection of small, nearly white, distinct crystals, melting at 187.5°. It dissolved in dilute acid, forming an almost colorless solution, which furnished a large quantity of pure aconitine salt. The regenerated alkaloid melted at 188.5°. This specimen consisted of almost pure aconitine.

(15–17) *Aconitine, Amorphous, from Aconitum Napellus (German).*—Three separate specimens of this material were examined. It is a yellow, amorphous powder, dissolving in dilute acid with the production of a colored solution. In each case, aconitine, isaconitine, homisaconitine, and aconine, were isolated, but the amount of aconitine obtained varied greatly; in one instance, as much as 20 per cent. of the substance was found to be aconitine, whilst in another as little as 5 per cent. was present. These products appear to represent the total alkaloids of A. Napellus.

In the light of these results, it is not surprising to learn that great variations have been observed in the toxic power of commercial specimens of aconitine.

For medicinal purposes nothing should in future be employed as aconitine but the pure crystalline alkaloid melting at 188–189°, and having the other characteristic properties recorded in Part I. (Trans., 1891, 59, 271) of this enquiry (see also on this point Pharm. Jour., 3, 23, 765).

Of the specimens now examined, only two (13, 14) approach this standard, and are entitled to be called aconitine. It is clear from the results which are here recorded that the fact that a specimen of this alkaloid is crystalline cannot alone be accepted as sufficient evidence of purity, as some physiologists have assumed. In the case of the salts, the crystalline nature of the specimens is no criterion that the substance is an aconitine compound, since the salts of isaconitine are also crystalline.—Am. Jour. Phar., 1883, 297; from Jour. Chem. Soc., 1893, 491.

Aconitine—Test for.—According to the Brit. and Col. Drug., a solution of potassium permanganate in sulphuric acid (1 in 200) is prepared, and a few drops are added to the supposed aconitine. If that alkaloid is present, the greenish color of the reagent gives place to a violet tint on agitation, the green restored on further addition of permanganate solution, agitation again causing the return of the violet, and so on. In this way a point is reached at which the color is no longer affected by agitation, but disappears at once on dilution with water.

Aconitine Aurichloride—Some Modifications of.—W. R. Dunstan and H. A. D. Jowett.—Pharm. Jour. Trans., 1045.

Aconitine into Isaconitine—Conversion of.—W. R. Dunstan and F. H. Carr.—Pharm. Jour. Trans., 1893, 1045.

The Alkaloids of Aconitum Napellus.—W. R. Dunstan. A lecture on the pharmaceutical aspects of their investigations. W. R. Dunstan commented on the practical importance to pharmacy of a chemical inquiry into the number, nature and properties of the alkaloids of Aconitum Napellus. He alluded to the chief points in connection with the subject about which we stood in need of further information. He showed how far this information has been supplied through the work which has been carried on in the Research Laboratory during the past year.—Phar. Jour. Trans., 1893, 752 and 765.

Napelline.—W. R. Dunstan and E. F. Harrison. The authors have investigated the nature and properties of the new alkaloid, which was found together with aconitine in the roots of Aconitum Napellus, to which it was proposed to assign the old and now disused name of napelline. The base itself is an amorphous varnish, which has, so far, resisted all attempts to

crystallize it. Several of the salts, however, notably the haloid compounds, crystallize well when nearly pure, and may be completely purified by repeated crystallizations, until a product of constant melting point is obtained.

The base regenerated from the pure hydrochloride is a colorless varnish, slightly soluble in water, though more so than aconitine, but readily dissolved by alcohol, chloroform, and less readily by ether. The alcoholic solution is feebly dextro-rotatory.

By analysis, napelline is proved to have the same composition as aconitine, and is therefore represented by the same empirical formula $C_{33}H_{45}NO_{12}$, and may be termed isoaconitine.

With auric chloride napelline exhibits a remarkable reaction which sharply distinguishes it from aconitine, and indeed from most other alkaloids. A definite aurochloride, $C_{35}H_{45}NO_{12}HCl,AuCl_3$, has so far not been obtained. When solutions of napelline hydrochloride and auric chloride are mixed, a yellow amorphous precipitate is thrown down, as in the case of aconitine. When this is crystallized from its solution in alcohol, nearly colorless crystals of aurochlornapelline ($C_{33}H_{41}(AuCl_2)NO_{12}$) separate. This is a derivative of napelline in which one atom of hydrogen is replaced by the group $AuCl_2$. The first-known alkaloidal derivative of this type, namely, aurochlorcaffeine, was described a short time ago by Dunstan and Shepheard (Pharm. Jour. Trans. [3], xxiii, 481), and the production of such a compound from napelline was altogether unexpected. Aurochlornapelline differs, however, from aurochlorcaffeine in not being converted by the action of hydrochloric acid into the aurochloride.

When napelline is heated with water in closed tubes or heated under ordinary pressure with mineral acids, it is gradually hydrolysed. The hydrolysis is more rapidly effected by aqueous soda or potash, which act even in the cold. It has been proved that there are only two products of hydrolysis, and that these are identical with the hydrolytic products of aconitine, and, moreover, are formed in the same proportion. The following equation represents the hydrolysis of napelline into aconine and benzoic acid, as well as the hydrolysis of the isomeric aconitine into the same products:

$$C_{33}H_{45}NO_{12} + H_2O = C_{26}H_{41}NO_{11} + C_7H_8O_2.$$

Both these substances have been isolated in the pure state, and the aconine has been closely compared with that derived from aconitine and ascertained to be identical with it.

From physiological experiments it seems doubtful whether napelline would prove toxic to man, except, perhaps, when given in very large doses. —Jour. Chem. Soc., 1893, 443; Pharm. Jour. Trans., 1893, 625.

Adonite.

Adonite, a crystallizable constituent of Adonis vernalis, present to extent of four per cent., has the formula $C_5H_{12}O_5$, and is apparently a new pentatomic alcohol. It is insoluble in ether and petroleum ether, has a neutral reaction, is very soluble in water, crystallizes in large transparent prisms, and has at first a sweet taste, rapidly giving place to a rather benumbing sensation. It crystallizes from alcohol in small needles, melts at 102° C.; does not reduce Fehling's solution, nor become brown with alkalies, but yields, with sulphuric acid a perfectly colorless solution, and heated upon platinum foil gives off the odor of caramel.—E. Merck, Arch. der Pharm., 1893, 129.

Alangine.

Alangine.—The alkaloid of Alangium Lamarckii (Cornaceæ). Definite therapeutic data are yet wanting. The bark is an emetic in doses of 45 grains. The alkaloid has not been obtained in a crystalline condition. It possesses an intensely bitter taste, is soluble in alcohol, ether, chloroform, and acetic ether, insoluble in water, and forms crystalline salts with the mineral acids, and acetic, tartaric, and oxalic acids.—Pharm. Zeit., 1893, 17.

Anemonin.

Anemonin.—In taking up the chemical examination of this substance, preliminary trials were made with a number of plants to ascertain its most productive source. The herbs of Anemone nemorosa L., A. Pulsatilla L., and A. pratensis L., Ranunculus reptans L., R. acer L (45 pounds yielded 11.5 gr.) and R. sceleratus L., and the leaves of Clematis angustifolia and C. integrifolia, all contain the principle; the leaves and tubers of Aconitum Napellus L. probably, although not certainly, also contain it. Of these several herbs, those containing it in largest amount, A. Pulsatilla, A. pratensis and Ranunculus acer, were used in the fresh state, cut up and distilled in a current of steam; the first distillates, strongly pungent, were collected separately, the later, weaker distillates were used in macerating fresh portions of the herbs. From these aqueous distillates chloroform extracted the pungent principle; by distillation most of the solvent was recovered, and the concentrated solution then set aside to crystallize. Anemonin crystallizes first, and after washing with chloroform (in which it is not very soluble), forms odorless crystals, melting at 150°–152° C. The mother-liquor from the anemonin crystallization solidified to a mass of hard, lustrous, rhombic prisms, which are called Anemon-camphor; this at 150° C., losing water, sinters together; at higher temperature it evolves pungent vapors and carbonizes at 300° C.; it possesses a very sharp, irritating odor, acting especially upon the eyes and mucous membranes of the nose and respiratory organs; placed upon the skin, it first causes reddening, and later produces painful blisters; the chloroform solution is

neutral, but decomposes (as does also the aqueous solution), and then has an acid reaction, due to the formation of anemonin and amorphous isoanemonic acid; whether this change is due to oxidation or to the splitting off of water has not been ascertained. It is due to this decomposition that these several drugs lose their pungency upon drying; it made considerable difference in the yield of the camphor whether the herbs were distilled as soon as gathered, or if six or eight days elapsed before doing so. Anemonin is colorless, inodorous, tasteless, of neutral reaction, and melts at 152° C.; in the melted state it has a burning taste and produces numbness of the tongue; it is slightly soluble in cold water and alcohol, easier if these solvents are hot—also in chloroform and fixed oils, but not in ether; it is soluble in aqueous alkalies, with yellow color, neutralizing them; it is volatile when boiled with water, the vapors being quite irritating; it readily reduces the salts of the noble metals, also Fehling's solution. It has the formula $C_{10}H_8O_4$, and is the anhydride of a dibasic acid containing an additional aldehyde or ketone group; it is unsaturated, uniting with four atoms of bromine; heating with acetic anhydride produces an isomer, isoanemonin. Besides the constituents mentioned, there were found two acids in these herbs: Anemonic acid, $C_{10}H_{10}O_5$, a dibasic acid with an aldehyde or ketone-group; can be made by boiling an aqueous solution of anemonin with lead oxide; it forms hard, white needles, melting at 210° C. Anemoninic acid, $C_{10}H_{12}O_6$, is also dibasic, and results by warming anemonin with dilute acids, HCl or H_2SO_4, also with bases like potassa and baryta; it forms a pale—brown powder, melting at 116–117° C. H. Beckurts, Archiv. der Pharm., 1892, 182–206.

Atropine.

Atropine—Detection of.—L. Fabis.—A patient at a hospital in Padua, who had for some time been treated by daily injections of 6 milligrams of strychnine nitrate, died a few hours after receiving an accidental injection of 3 milligrams of normal atropine sulphate, exhibiting acute symptoms of atropine poisoning. At the post-mortem, the presence of bilateral mydriasis, and of congestion of the meninges and of the cerebellum, became evident. On examining the viscera by the Stas-Otto method, clear indications of the presence of an alkaloid were obtained, but on applying the special reactions for strychnine and atropine, the results were negative. To test the possibility of these alkaloids obscuring each other's reactions, mixtures of 3 per cent. solutions (the strength of the injections) of strychnine nitrate and atropine sulphate were tested with sulphuric acid and potassium dichromate, and by Vitali's reaction, with the following results: A mixture of equal parts of the solutions gave the strychnine reaction very clearly, but the atropine reaction not at all; a mixture of 1 of strychnine with 3 of atropine gave the strychnine reaction, but not that of atropine; a mixture of 1 part of strychnine with 4 of atropine gave indistinct

reactions for both alkaloids; a mixture of 1 of strychnine with 5 of atropine gave a momentary atropine reaction; the characteristic violet coloration is, however, immediately superseded by a reddish tint. Vitali's reaction was not clearly obtained until at least 9 parts of the atropine solution were added to 1 of strychnine. It further appeared that a solution of strychnine too dilute to give the characteristic reactions of that alkaloid may effectually obscure the atropine reaction; thus 1 drop of the 3 per cent. strychnine solution diluted with 10 drops of water scarcely yields the strychnine reaction; on adding 4 drops of atropine solution to this, no reaction for atropine could be obtained.

A piece of meat injected with 0.05 C.c. of a 3 per cent. solution of each of the alkaloids, and extracted by the Stas-Otto process, yielded a barely sensible strychnine reaction and no trace of atropine. Finally, on injecting a mixture of 3 parts of the 3 per cent. strychnine solution and 1 part of the atropine solution into a frog, paralysis of the lower limbs and a great augmentation of the nervous sensibility ensued; on introducing the mixture into the eye of a dog, distinct mydriasis was observed in fifteen minutes. It thus appears that in cases of poisoning by atropine, the physiological evidence may be conclusive when the chemical tests yield doubtful results.—Gazzetta, 22, 1, 347; Jour. Chem. Soc., 1892, 1534.

Atropine in Hyperacidity of the Stomach.—Dr. Voinovitch (Bullet. de Thérapeut., 1892, 471) based on the experiments of Drs. Netschaeff and Popoff, exhibited sulphate of atropine in a case of stomachal hypersecretion. The dose used was three-quarters of a milligram three times a day by the mouth. After the third day pain had stopped and vomiting had ceased. After the tenth day the gastric juice was examined and found to be almost normal.—Am. Jour. Pharm., 1892, 515.

Atropine as a Hæmostatic.—In two cases of profuse metrorrhagia, A. N. Dimitrieff has obtained good results by the subcutaneous injection of atropine in doses of 0.0003 gram. In the first case the hemorrhage stopped after four injections; in the second, after three. Atropine is sometimes of service when other hæmostatics have failed.—Quarterly Therap. Rev., July, 1892; Am. Jour. Pharm., 1892, 552.

Other Bases of the Solanaceæ.—See Solanaceous Bases.

Alkaloid in Beer.

The Alkaloid in Beer.—Fasbender and Schoeff make clear the distinction between colchicine and the alkaloidal substance obtained from hops.—Dutch Tijdschr. v. Pharm., 1892, 132; Bull. Pharm., 1892, 622.

Belladonna—Alkaloids of.—See Solanaceous Bases.

Alkaloids of Berberis.

Berberis Alkaloids—Berberine and Hydroberberine.—Schmidt has

caused fresh experiments to be made, which confirm and amplify those carried out by Schreiber and Gage.—Arch. der Pharm., 1892, 287–320.

Berberis Aquifolium and B.vulgaris—Alkaloids of.—C. Rüdel. The publications of Wacker, of Hesse and of Stubbe on the alkaloids of the roots of Berberis vulgaris, and those of Parsons, of Jungk and of Stubbe on the alkaloids of the roots of Berberis Aquifolium, show that each contains three alkaloids, and that they are in all probability the same. The chemical formulæ and the exact description of the salts were not, however, very perfectly defined, and the author is endeavoring to complete this part of the work.

Oxyacanthine, $C_{19}H_{21}NO_3$.—The elementary analyses of the specimens of this alkaloid, as obtained from the two different sources, agreed closely with the above formula. The melting point lay between 174° and 185°; the base appears to exist in an amorphous and in a crystalline modification. It reacts with the usual alkaloid reagents. The salts prepared were the normal sulphate, $(C_{19}H_{21}NO_3)_2H_2SO_4 + 4H_2O$, white and crystalline; the hydrochloride, $C_{19}H_{21}NO_3HCl + 2H_2O$, prepared from the platinochloride by precipitating the platinum with hydrogen sulphide, white and crystalline; the platinochloride $(C_{19}H_{21}NO_3)_2H_2PtCl_6 + 5H_2O$, a yellow, amorphous salt which could not be obtained crystalline; and the aurochloride, $C_{19}H_{21}NO_3HAuCl_4 + 4H_2O$, a golden-yellow, amorphous substance, which likewise could not be obtained crystalline. These salts of oxyacanthine from different sources were alike in all respects.

Berbamine, $C_{18}H_{19}NO_3$, separated from the solution of the alkaloids by the addition of sodium nitrate, was purified by precipitating the solution of the sulphate with ammonia and recrystallizing from anhydrous ether. Thus obtained, it forms a fine, white, crystalline mass. The specimens from both sources proved to be identical. The following salts were prepared; the normal sulphate, $(C_{18}H_{19}NO_3)_2H_2SO_4 + 4H_2O$, crystalline; the platinochloride, $(C_{18}H_{19}NO_3)_2H_2PtCl_6 + 5H_2O$, a light-yellow, amorphous powder; and the aurochloride, $C_{18}H_{19}NO_3HAuCl_4 + 5H_2O$, a golden-yellow amorphous powder.

Berberine, $C_{20}H_{17}NO_4$, was most readily separated by Gaze's acetone method. Acetoneberberine, $C_{20}H_{17}NO_4C_3H_6O$, was obtained as a lemon-yellow, crystalline powder; acid berberine sulphate, $C_{20}H_{17}NO_4H_2SO_4$, prepared by treating acetoneberberine with dilute sulphuric acid, is a pale-yellow crystalline salt; the nitrate, $C_{20}H_{17}NO_4HNO_3$, prepared by treating the acetone compound with the exact quantity of nitric acid, is a crystalline, yellowish-red salt; the platinochloride, $(C_{20}H_{17}NO_4)_2H_2PtCl_6 + H_2O$, prepared by precipitating the hot solution of the hydrochloride with platinum chloride, is obtained as a yellow, crystalline precipitate; the hydrochloride, $C_{20}H_{17}NO_4HCl + 4H_2O$, obtained by decomposing the acetone compound with hydrochloric acid, is a light orange-yellow-colored salt.

Since Gaze found a "methylberberine" accompanying the berberine

which he obtained from hydrastis berberine, the author converted a considerable quantity of his berberine specimens into hydroberberine, by reduction with zinc and sulphuric acid, and searched very carefully among the crystals of hydroberberine which were obtained for any second substance. No such other alkaloid could, however, be found.—Arch. Pharm., 229, 631–666; Jour. Chem. Soc., 1892, 641.

Berberine—Pyridinecarboxylic Acids Obtained from.—Mayer.—Abstract, Jour. Chem. Soc., 1892, 1357.

Berberine Carbonate Crystallized.—Merck's Jahresber., 1892; Zeits. Oest. Apoth. Ver., 1893, 84.

Berberinum Sulfuricum Crystallisatum Solubile.—A new preparation soluble slightly in water and alcohol. For methods of administration see Pharm. Post, 1893, 71.

Brucine.—See Strychnine.

Caffeine.

Caffeine and Theine—Their Identity, and the Reactions of Caffeine with Auric Chloride.—W. R. Dunstan and W. F. J. Shepheard, having extracted theine from tea and caffeine from coffee, found that these two substances exactly resemble each other and melt at precisely the same temperature, viz., 234.5° (corr.). From each base the crystalline aurochloride ($C_8H_{10}N_4O_2HClAuCl_3,2H_2O$) was prepared, and these two salts both melted at 242.5° (corr.). When dried at 100° they both lost the equivalent of two molecular proportions of water, and the anhydrous salts melted at the same temperature, viz., 248.5° (corr.). The analytical data corresponded with the formulæ given above. The complete correspondence in the properties and composition of the aurochlorides is satisfactory evidence of the absence of a structural difference in the bases. In order to further confirm the identity of the two substances, a specimen of each was converted into the mercuric chloride compound ($C_8H_{10}N_4O_2HgCl_2$), a stable crystalline salt. Both preparations were found to melt at the same temperature, viz., 246° (corr.), and to exactly correspond with each other in other respects.

The complete identity of caffeine and theine having thus been demonstrated, the observed differences in their physiological action must be ascribed either to impurities in the specimens used, or to variations in the animals employed in the experiments. The circumstance that theine was found to be more active than caffeine, and to be capable of producing effects not produced by caffeine, tends to support the view that the theine was impure. It is now well known that tea contains other bases than caffeine, the presence of traces of which might be sufficient to account for the observed differences.

The authors also obtained two new and interesting derivatives from both

caffeine and theine of the following composition: $C_8H_9(AuCl_2)N_4O_2$ and $(C_8H_{10}N_4O_2KCl,AuCl_3)$.—Pharm. Jour. and Trans., 1892, 481.

Caffeine and the Question of Its Isomerism.—A. B. Prescott gives the following table of the analyses of infusions of tea and coffee:

	Alkaloid.		Tannins.		Soluble Ash.		Potassa.		Other Soluble Substances.	
	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.
I. *Total Content*, in percentages:										
1. Geisler, 1884: in averages of 30 grades....	2.6	....	15.2	....	3.5	....	....	....	21.7	
2. Dragendorff, Univ. Dorpat, 1874: 23 grades.	2.0	1.1	12.4	....	....	....	2.3	2.4	17.0	
3. The writer and Mr. Clark, 1876: 15 grades.	.....	....	12.0							
II. *Dissolved in Infusions*, as per cent. of dry article:										
1. Geisler, 1884: by infusion at 100° C... ...	2.4	....	9.2	....	3.8	....	1.4	....	12.5	
2. Fellows, 1880: by 10 minutes	.....	....	0.6	0.0						
3. Fellows, 1880: by 20 minutes.	.....	....	1.5	0.1						
4. Fellows, 1880: by 30 minutes.	.....	....	2.5	0.8						
5. Kenrick, 1891: 13 black teas	2.8	....	5.4	....	3.5	....	....	....	12.0	
6. Kenrick, 1891: 18 Japan teas.	2.5	....	9.4	....	3.6	....	....	....	14.6	
III. *Content of Infusions*, in grains per pint:										
1. Calculated from Geisler (II. 1).....	2.5	....	4.13	....	3.8	....	1.4	....	12.5	
2. Calculated from Kenrick (II. 5, 6).....	2.65	....	5–9	....	3.5	....	....	....	13.3	
3. By Fellows direct.....	.....	....	3.3	0.9						
4. Calculated from I. 2 and other sources.....	.....	3.5	.....	....	....	9.5	....	6.3	.....	56.0
5. Frequent proportions, summarized.....	2.5	3.5	7.0	0.7	3.5	9.5	1.4	6.3	13.0	56.0

The following conclusions are evident:

1. The alkaloid counted as caffeine is mostly dissolved by ordinary hot infusions and by decoctions of tea and coffee, even if brief in maceration. Of the two beverages, coffee is apt to be a little the richer in alkaloid, but this difference is not distinctive. Three grains per pint is a common proportion.

2. Tea beverage is very rich in tannins, which are nearly absent from coffee beverage. Tannins are very slowly drawn into infusion, so that the time and temperature of infusion govern its astringency. A cup of tea may have from two to six times as much of tannin as it has of alkaloid.

3. Coffee beverage carries quite constant potassium salts, amounting to four times the quantity in tea beverage. A cup of coffee contains potassium salts about twice the quantity of its alkaloid. Some of the potassium is in form of phosphate.

4. The nutrient and other remaining solids in coffee infusions amount to four times the quantity of the corresponding solids in the infusions of tea. A pint of coffee contains an average of 50 to 60 grains of solids beside alkaloid, ash, and tannin. The pharmacology of some of these bodies ought to be studied.

5. There follow to be determined, the homologues of caffeine (theophylline, theobromine, and xanthine), their presence, quantity, and effect. Then remains, if found at all, any evidence as to isomeric caffeines.

The author discusses the known constitution of caffeine itself and from the present state of evidence reaches the following conclusions:

1. The five beverage plants (coffee, tea, guarana, maté and kola) owe some of the differences in their effects to their different yields of bodies not classed as active principles.

2. The total active principle of a beverage plant, the "theine," "caffeine," etc., as obtained, is perhaps liable to contain small quantities of xanthine and other homologous bodies of physiological effect.

3. The main active principle in each of the five beverage plants is, unquestionably, a trimethyl-xanthine. Chemical studies indicate, as yet, only one trimethyl derivative of xanthine. If, however, strictly pure trimethyl-xanthine, known as caffeine, from one plant clearly differs in physiological effect from the same body taken in strict purity from another plant, then the chemist will recognize a proof of isomerism, and await its explanation by later chemical researches.—Jour. Amer. Med. Assoc., Jan. 28, 1893.

Caffeine Salts.—By direct combination with the acids, and drying over quicklime or sulphuric acid, the following salts were made: Nitrate, $C_8H_{10}N_4O_2HNO_3$; acetate, $C_8H_{10}N_4O_2(HC_2H_3O_2)_2$; propionate, $C_8H_{10}N_4O_2(HC_3H_5O_2)_2$; citrate, $C_8H_{10}N_4O_2(H_3C_6H_5O_7)$ (this compound at 100° C. loses no weight, is soluble in a mixture of chloroform and alcohol and the alcoholic solution does not at once redden blue litmus paper. A mixture of caffeine and citric acid in molecular proportion at 100° C. loses about 8 per cent. water of crystallization, while it is soluble in a mixture of chloroform and alcohol; the alcoholic solution reacted acid at once). The formate, butyrate and valerianate could not be obtained containing the theoretical quantities of acid. The acid sulphate, $C_8H_{10}N_4H_2SO_4$, was readily obtained from the alkaloid and sulphuric acid in alcoholic solution; exposed to the air for a few days the salt takes up one molecule of water. The neutral sulphate could not be obtained pure.—E. Schmidt and R. Gaze, Arch. der Pharm., 1893, 1–10.

Tea—The Alkaloid of.—Mr. Allen stated that theine could be dried without loss of weight at 100° C., and that it undergoes decomposition when boiled with lime water. He recommended that in the analytical determination of theine, tea should be first extracted with water, and that after triturating the extract with lime or magnesia, the theine should be dissolved out of the dried mixture with alcohol. In the discussion of this paper it was remarked that the points which were beyond dispute had already been made known, and that in several respects the statements made were at least questionable.—(Brit. Pharm. Conference) Pharm. Jour. and Trans., 1892, 213–220.

Theine in Tea—Estimation of.—N. V. Sokoloff.—Abstract, Jour. Chem. Soc., 1893, 352.

Caffeine in Tea—Estimation of.—After examining a number of methods for the assay of tea, many of which yield the alkaloid more or less colored, Cazeneuve and Biétrix recommend (Reper. de Pharm., May, 1892) the following, which yields the maximum amount of caffeine almost colorless: The alkaloid is liberated by lime, extracted with chloroform, the chloroformic solution evaporated, the residue treated with boiling water in the presence of a little animal charcoal, and the filtrate concentrated upon the water bath.—Am. Jour. Pharm., 1892, 468.

Caffeine—Estimation of.—Alex. Grandval and Henri Lajoux publish the following process in Jour. de Pharm. et de Chim., June, 1893, pp. 545 to 549.

The substance to be examined is finely pulverized, 5 Gm. of it are moistened with a mixture of 5 Gm. of 66 per cent. ether and 1 Gm. ammonia water, and placed in a continuous extraction apparatus with 50 C.c. chloroform, until a portion upon evaporation leaves no residue. The solution is distilled and to the dried residue, 1 C.c. $\frac{1}{10}$ sulphuric acid added, for the purpose of obtaining the caffeine colorless. The acidulated residue is extracted with several small portions of boiling water and filtered, keeping the filter covered with a glass plate, so as to prevent the crystallization of the caffeine upon the filter. The yellowish filtrate supersaturated with ammonia, is evaporated to dryness on a water-bath, when a large portion of the coloring matter forms, with the ammonium sulphate, a kind of compound insoluble in chloroform. The dry residue is treated with chloroform, and the solution filtered; the container and filter are washed until a drop of the filtered liquid leaves no residue upon evaporation. If the chloroformic solution is evaporated very slowly, the product is colorless or nearly colorless caffeine, perfectly crystallized and entirely free from tannin. The process requires no more than three hours, and the following are some of the results obtained with it, in the author's hands, for 1,000 parts of the material: Black Souchong tea 29 parts, green coffee (mixture) 9.88 parts, roasted coffee 9 parts, and kola nut 23 parts of caffeine.—Amer. Jour. Pharm., 1893, 338.

Caffeine—A New Method for the Rapid Determination of.—Guillot.—Arch. de méd. et pharm. mil., Paris, 1893, 197.

Caffeine Citrate.—Soucheyre.—Rép. de Pharm., 1893, 206.

Caffeine, Kola Powder, Kola Red, and Kola Extract—Comparative Physiological Examinations of.—Monavon and Perroud.—Jour. Pharm. Chim., 1892, 547.

Carpaine.

Carpaine, the alkaloid discovered by Greshoff in the leaves of Carica Papaya, L., is present in the young leaves to the extent of 0.25 per cent., while in old leaves only 0.07 per cent. is present. J. J. L. van Ryn, in

operating with 80 kilos, obtained 60 grams of the alkaloid, which was obtained perfectly colorless by recrystallizing first from ether, later from alcohol. The properties, as described in the Proc. A. P. A., 1891, 230, were confirmed, but one correction being necessary; the crystals melt at 121° C. (corr.) instead of 115°; the alkaloid turns red litmus blue, but is indifferent to phenolphthalein; the strongest reagents were apparently without action upon the alkaloid. Sulphuric acid and bichromate of potassium gave a green coloration, but the acidified alkaloidal solution with a drop of potassium permanganate solution retained the red color for several hours. Carpaine has the composition, $C_{14}H_{25}NO_2$; the platinochloride, $(C_{14}H_{25}NO_2HCl)_2PtCl_4$; the aurochloride, $(C_{14}H_{25}NO_2HCl,AuCl_3)_2+5H_2O$; the halogen salts decrease in solubility in the order in which they are given: $C_{14}H_{25}NO_2HCl$, $C_{14}H_{25}NO_2HBr$, and $C_{14}H_{25}NO_2HI$; the sulphate, $C_{14}H_{25}NO_2H_2SO_4+3H_2O$, owing to its solubility in water, was not crystallizable, but by the addition of ether to an alcoholic solution large colorless prismatic crystals separated after a time. The nitrate, $C_{14}H_{25}NO_2HNO_3+H_2O$, is only soluble to the extent of 2 per cent. in water, but if to a 1 per cent. solution of the hydrochlorate a few drops nitric acid be added, a separation of the nitrate occurs, showing the decreased solubility of this salt in hydrochloric acid. The observations made by Dr. v. Oefele established that, with the exception of the caffeine group, carpaine was the only digitalis substitute which by subcutaneous injection did not cause local irritation or abscesses, while internal doses of 0.025 Gm. per day did not show any advantage over digitalis. The hypodermic use of 0.006–0.010 Gm. daily or on alternating days is recommended; the effect of the hypodermic injection is noticeable in the course of a few minutes.—Arch. der Pharm., 1893, 184–211.

Cascarin.

Cascarin, $C_{15}H_{14}O_5$, is a crystalline principle isolated by Leprince from the bark of Rhamnus Purshiana. The bark is treated with a hot solution of soda, the infusion neutralized with sulphuric acid, and the filtrate concentrated in vacuo; the precipitate is redissolved in hot soda solution, and this is rendered slightly acid; the residue left on evaporation is dried, treated with acetone, the liquid acidulated with sulphuric acid and poured into a large quantity of boiling water. The precipitate, after further purification, forms prisms, which have a more or less deep yellow color, depending upon the amount of water in combination. On fusion with potassium hydrate, phenol is produced.—Compt. rend., cxv, 286; Am. Jour. Pharm., 1893, 16.

Cascarin and Rhamnoxanthin.—According to M. Phipson, the yellow crystalline substance obtained by Leprince from the bark of Rhamnus Purshiana is identical with that from Rhamnus Frangula. The two substances have the same chemical formula, the same molecular composition, and the

same characters. Buchner extracted rhamnoxanthin from the latter tree as early as 1853.—Rép. de Pharm., Oct., 1892.

Cephalanthin.

Cephalanthin.—C. Mohrberg. By extracting cephalanthus bark with boiling water and fractionally precipitating the extract with lead acetate, in three fractions, there were obtained in the first cephalanthin and coloring matters, in the second a tannin, and in the third a saponin. But the greater portion of the cephalanthin is contained in the pressed bark, and is obtained by boiling this with lime water, precipitating the lime with carbonic anhydride, and, finally, the cephalanthin with hydrochloric acid. It is very bitter, even in dilution of 1 : 15,000, very soluble in alcohol, ethyl acetate, ammonia and soda, slightly in hot and cold water, ether and chloroform, not at all in benzene and light petroleum. It is a feeble acid, and displaces carbonic anhydride from carbonates. Its composition is $C_{22}H_{34}O_6$; it begins to liquefy at 177°, and melts at 180.1° (corr.), and in alkaline solution has $[\alpha]_D = 20.25°$. Strong sulphuric acid colors it orange, hydrochloric acid violet, sulphovanadic acid pink, dilute gallic acid or strong sulphuric at 70° at first red, then violet, α-naphtholsulphonic and thymolsulphonic acids violet or reddish-violet. Acids decompose it into a sugar, $C_6H_{12}O_6$ (whose phenylosazone melts at 196–198°), and an acid substance, cephalantëin, $C_{16}H_{23}O_3$; it is thus a glucoside.

The cephalanthus tannin mentioned above is a reddish-yellow powder, soluble in alcohol and hot water, and gives a green coloration with ferric salts. It is probably a mixture of "true tannic acid" with another substance, the cephalethin of Claassen. The cephalanthus saponin is a poison which dissolves the blood corpuscles; it is not very active, however.

Cephalanthin, when injected, acts as a poison, dissolving the blood corpuscles, the coloring matter of which goes into the serum and the urine as oxyhæmoglobin, and is then changed into methæmoglobin. Cramp, vomiting, and paralysis appear, and jaundice, caused by an enormously increased secretion of bile. Among the earlier symptoms are movements of the intestines, but neither the heart, vagus nerve, nor vaso-motor system is affected. The iron separated out in the liver gets into the spleen, lymphatic glands, and marrow, and is used up in the formation of blood; a part goes into the kidneys.—Chem. Centr., 1892, ii, 363; from Arb. Pharm. Inst. Dorpat, 8, 20–50; Jour. Chem. Soc., Abstr., 1893, i, p. 112; compare also E. M. Hatton, Amer. Jour. Phar., 1874, p. 310, and E. Claassen, Pharm. Rundschau, 1889, p. 131.

Cinchona Alkaloids.

Cinchona Alkaloids—Manufacture of.—W. D. Field.—Amer. Drug., 1892, 152 and 89; from Jour. anal. and app. Chem.

Conversion of Cinchona Alkaloids into Isomerides—Skraup working

with Pum and Neumann, on the hydriodides of various cinchona alkaloids, has found that little or none of the original alkaloid is reformed, but that new isomeric bases are produced.—Ber. d. Chem. Ges., xxv, 2909.

Cinchona Alkaloids.—Halogen Derivatives of.—Comstock and Koenigs now hold the view that only one quinoline residue is present in the cinchona alkaloids, and that the so-called second complex ($C_{10}H_{16}NO$), which in cinchonine and cinchonidine is combined with a quinoline residue, and in quinine and quinidine with a paramethoxyquinoline residue, consists of hydrogenized benzene and pyridine nuclei, combined in a manner similar to that which Merling has suggested for tropine and ecgonine. —Ber. d. Chem. Ges., xxv, 1539.

——— *Alkyl Derivatives of.*—Claus insists on his prior claim to the subject.—Jour. prakt. Chem., xlv, 398.

——— Claus gives an account of some experiments made by himself and his pupils.—Ann. der Chem., 269, 232.

Cinchona Alkaloids—Compounds of the—The Hydriodo.—Lippmann and Fleissner.—Abstract, Jour. Chem. Soc., 1892, 1363.

Cinchona Alkaloids, particularly Quinine.—A. Claus in a polemical article deals with Grimaux's paper on quinine methiodides.—Jour. f. prakt. Chem., 46, 336.

Alkyl and Alkylene Derivatives of Cinchonic Acid and Alkylene Derivatives of Cinchoxinic Acid.—A. Claus.—Ann. der. Chem., 270, 335.

Apocinchonine and Diapocinchonine.—E. Jungfleisch and E. Léger. These authors consider that diapocinchonine, obtained by Hesse, is a mixture and not a definite compound. It is resinous and yellowish, four of its salts are amorphous like itself, and it is in fact nothing but a combination of alkaloids removed by ether from the mixture separated by alcohol from apocinchonine.—Comptes rendus, cxiv, 1192; Pharm. Jour. and Trans., 1892, 1.

Cincholine and Fluoroline.—By Hesse. It has been frequently observed that in the preparation of non-volatile bases minute quantities of volatile bases have been obtained, and in conditions which appear to justify the inference that these latter exist in the material operated upon. Hesse has now ascertained that the volatile bases thus obtained often originate from the solvents used. This is the case with cincholine and fluoroline.—Annal. der Chem., 271, 95.

Apocinchene—Oxidation Products of.—Koenigs.—Ber. d. Chem. Ges., xxvi, 713.

Cinchonamine Sulphate.—According to Arnaud and Charrin, this salt from Remijia Purdieana is poisonous; its sulphate provoking tonic convulsions. Like quinine, it is a febrifuge.—Abstract, Jour. Chem. Soc., 1893, 223.

Cinchonamine—The Physiological Action of.—Chauin in a report to the Biological Society stated (La Tribune médicale) that this alkaloid has a toxic action upon animals, and effects a considerable reduction of temperature in animals which had been rendered feverish by inoculation, or by the administration of chemical compounds.—Am. Jour. Pharm., 1892, 607.

Cinchonine—Molecular Transformation of.—G. Pum.—Abstract, Jour. Chem. Soc., 1893, 181.

Cinchonine.—Freund and Rosenstein continue the work on the halogen alkyl compounds of cinchonine and the products obtained by treating them with potash.—Ber. d. Chem. Ges., xxv, 880.

Cinchonine or Cinchonidine Sulphate.—These salts subjected for fifteen hours to an electric current from a 4-cell Bunsen battery have shown in the hands of Boussonet (Rép. de Pharm.), the thalleioquin reaction of quinine and quinidine.

Cinchonidine—Action of Hydriodic Acid on.—C. Neumann.—Abstract, Jour Chem. Soc., 1893, 231.

Cupreine and its Derivatives.—Physiological Action of.—Grimaux and Laborde.—Abstract, Jour. Chem. Soc., 1893, 223.

Quinine—Conversion of Cupreine into.—Hesse replies to Grimaux and Arnaud.—Ann. der Chem., 269, 143.

Quinine—Bases Homologous with.—Grimaux and Arnaud.—Compt. rend., cxiv, 672.

——— *Methiodides.*—E. Grimaux.—Compt. rend., cxv, 117.

Quinine.—Determination of Quinine in Presence of other Alkaloids of Cinchona.—L. Barthe, in Jour. Pharm. Chim., 1893, 125.

Quantitative Estimation of Quinine by Titration Methods.—Also Separation of other Alkalolds of Quinine, especially of Cinchonidine.—A. Christensen.—Overs o. d. k. Danske Vidensk. Sesk. Forh., Kjobenh., 1891, No. 3, 191–238.

Quinine Double Salts.—E. Grimaux.—Compt. rend., cxv, 608.

Quinine Hydrochlorate.—A note by Boni relating to the preparation of this salt.—Giornale farmac trentino, 1893, No. 3; Pharm. Post, 1893, 272.

Quinine Iodomethylates.—E. Grimaux.—Compt. rend., July 11, 1892; Abstract, Chem. News, 1892, 84.

Quininum Saccharinum.—The bitter taste of quinine is covered by saccharin.—Merck's Ber., Jan., 1893; Pharm. Centralh., 1893, 62.

Quinine Sulphate.—L. Barthe. Examination for impurities and solubility of the pure salt.—Jour. Pharm. Chim., 1893, 122.

Mixtures of Sulphates of Quinine and Cinchonidine—Aqueous Solution of.—Prunier and Cheynet. A continuation of the studies upon mixtures of alkaloids of cinchona.—Jour. Pharm. Chim., 1893, 120.

Quinine Tannate of the VII. Austrian Pharm.—Critical Examination of.—G. Hell and Co.—Pharm. Post, 1892, 1346.

Use of Quinine—Danger from the Popular Misuse of.—W. T. Parker. —Science, 1892, 155.

Quinine Sulphate—Elimination of.—This salt given in doses of 0.50–1 Gm. to healthy persons, is eliminated in about forty-eight hours, the elimination commencing in the first half hour after its ingestion.—M. J. Roux, in Jour. de Pharm. et de Chim., 1892, 457.

Artificial Quinine.—A mixture of 3.1 kg. of cupreine, 0.25 kg. sodium, 30 kg. methyl alcohol and 1 kg. of methylbromide is heated for ten hours at 120° to 130° in an autoclave apparatus. The alcohol is then removed by distillation, the residue treated with dilute sodium hydrate solution, to remove any undecomposed cupreine, and, after drying, ether is applied to extract the quinine from the residuum. In place of the methylbromide other compounds of methyl may be used. In case ethyl or propyl combinations are used instead of the methylbromide, etc., corresponding ethyl and propyl cupreine combinations result, the former melting at 160°, the latter at 164°, and all show a characteristic blue fluorescence in dilute sulphuric acid solution.—Pharm. Zeit.; Pharm. Record, 1893, 64.

——— *Physiological Action of.*—The physiological action of the synthetic quinines has been examined by Grimaux and Laborde (Jour. de Pharm. et de Chim., 1893, 462), and found to be similar to that of natural quinine. The most active of three compounds prepared by MM. Grimaux and Arnaud is quinopropyline; next in order, quinethylene; while cupreine stands lowest, the action becoming more pronounced in proportion as the substituted group belongs to a higher series.

Chloro-hydrosulphate of Quinine—Preparation of.—Dissolve in the cold 30 parts crystallized quinine sulphate in 24 C.c. hydrochloric acid (1.050), and allow the solution to evaporate spontaneously in dry air. A gelatinous layer separates, which rapidly forms a hard mass of small agglomerated needles. The salt is very soluble in water, dries again in dry air, and loses three molecules of water at 100° C.—Compt. rend. de l'Acad. d. Scien.; Am. Jour. Pharm., 1893, 174.

——— *The Physiological and Therapeutic Action.*—Grimaux mentions several double salts of quinine, the chlorohydro-sulphate, bromhydro-sulphate, chlorohydro-phosphate, etc. He specially mentions the chlorohydro-sulphate of quinine as worthy of employment in therapeutics. This salt offers the medicinal advantage over the sulphate of being very soluble in water. It dissolves in its own weight of water, and consequently is rapidly absorbed. It may, moreover, be administered in hypodermic injections.—L'Trib. Med.; The Am. Therap., 1893, 168.

Phenacetin, Methacetin and Hydracetin in Presence of a Quinine Salt.—A new color reaction.—Gigli, in Pharm. Centralh., 1893, 169. (See New Remedies.)

Coca—Alkaloids of.

Manufacture of Cocaine in Peru.—The manufacture of cocaine is carried on at Callao, the leaves used being produced in the province of Huanaco. The quantities exported during the year 1892 are as follows: London, 2672 pounds; Hamburg, 932; New York, 221; the total weight being 3825 pounds, valued at £23,422, 10s.—Phar. Jour. Trans., 1893, 932; from Consular Reports, 6, 1185.

Cocaine—Test for.—To a small quantity of the alkaloid add 1 C.c. nitric acid (sp. gr. 1.4) and evaporate to dryness on a water bath; to the cold residue add one drop of an alcoholic potash solution (amyl instead of ethyl alcohol gives a better reaction); no change is noticed until the test is warmed again on the water-bath, when an intense violet coloration will suddenly appear. The test differs from the one obtainable with atropine, inasmuch as the violet coloration here appears in the cold and is destroyed by subsequent heating on the water-bath.—A. Kuborne, Pharm. Centralh., 1892, 411 and 432.

——— *Effects of.*—The frequent and continued use of cocaine upon the nasal mucous membrane, according to Dr. Seifert (Rev. Laryngol., 1892, No. 6), produces a local paralysis and hypertrophy of the mucous membrane; in addition to these, general effects are noticed, like inability for intellectual work, insomnia and palpitation of the heart. These symptoms improve rapidly after the cessation of the medicament.—Am. Jour. Pharm., 1892, 367.

——— *The anæsthetic Effect of.*—According to Bignon the anæsthetic effect of cocaine is entirely lost in solution of acid reaction, and is most decided if a trace of free alkali be present.—Therap. Monatschr.; Pharm. Review, 1892, 200.

——— *Antidotes.*—S. Mitchell (Medical Record) has found that while ammonia, digitalis and brandy will relieve the milder toxic manifestations of cocaine poisoning, they signally fail when these symptoms are superseded by severe præcordial pain, weak and rapid pulse, sighing respiration, borborygmus and belching of wind, muscular rigidity, and later paralysis of the whole body except the brain, which is unnaturally active. In such a case he used a large teacupful of clear coffee, and has found it equally efficacious on subsequent occasions. It can be administered cold or hot. He makes no mention of amyl nitrite.

Gluck (Ibid.) advocates dissolving the cocaine in a 3 per cent. solution of phenol. This, he claims, prevents the toxic effects of the former drug and renders the solution stable; as is well known, such solutions otherwise lose their anæsthetic effects after 24 hours. Phenol, besides, has a certain

anæsthetic power of its own, forms a superficial eschar, which prevents absorption of the cocaine, destroys bacteria, fungi, &c., prevents decomposition in the solution, renders it aseptic, and wards off reactive congestion.—Pharm. Record, 1892, 406.

Cocaine Poisoning—Prevention of.—Smith (Med. and Surg. Rep.) recommends that patients be prepared by giving them a drop of one per cent. alcoholic solution of trinitrine a minute before administering the cocaine, repeating the dose at intervals if the pulse be not affected and no pain or fulness in the temporal region be felt. The trinitrine acts almost as rapidly and continues to affect the vaso-dilators for upwards of half an hour longer than nitrite of amyl.

Cocaine Prepared Extemporaneously.—J. Kochan (West. Drug., 1892, 380.)—Dissolve any quantity of the hydrochloride of cocaine in a small quantity of water—say one drachm in half an ounce of water—in a test-tube of one and one-half or two-ounce capacity; add to the solution sufficient water of ammonia to entirely precipitate the alkaloid, or until the odor of ammonia is noticeable in the mixture, then add to it half a fluidounce of chloroform, cork securely and shake until the liberated alkaloid has entirely dissolved in the chloroform. Set aside for a short time to separate, pour off the aqueous layer, wash once or twice with distilled water, pouring off as much of the water as possible, and finally removing the remainder of the water by means of blotting paper. After the chloroformic solution has been entirely freed from water it may be transferred to a watch glass, and, by means of gentle heat, evaporated. The alkaloid will be obtained in a semi-crystalline condition, without loss, at very little expense, and in a reasonably short time.

Cocaine Cantharidate, made according to directions of Hennig (by union of 2 molecules cocaine hydrochlorate with 1 molecule cantharidin dissolved in 2 molecules NaOH), is not a chemical compound, but merely a mixture from which the sodium chloride, however, is removed by an unpublished process; it is claimed to have notable therapeutic advantages over the cantharidates in the treatment of pulmonary tuberculosis and chronic catarrhal affections of the air passages. The remedy presents an amorphous, white, odorless powder of unpleasant, pungent taste; it is soluble in boiling water and insoluble in alcohol, ether and benzin. Because of greater stability the following solution is recommended for subcutaneous injections: cocaine cantharidate 0.075–0.15 dissolved in chloroform water 50.0; the dose representing $\frac{1}{10}$ milligram cantharidin.—(Berl. Klin. Wochenschr.) Apoth. Ztg., 1892, 522.

Cocaine Hydrochlorate.—The melting point of this salt given as 181.5° C. in a number of standard works of reference, is erroneous; W. Kinzel ascertained that the melting point of the pure salt was 201–202°C. and this was confirmed by other investigators. The low melting point is

ascribed to the presence of small quantities of other alkaloidal salts.—Pharm. Ztg., 1893, 25.

Ecgonine—Amides of.—Einhorn and de Norwall.—Ber. d. Chem. Ges., xxvi, 962.

Anhydroecgonine—Constitution of.—Einhorn and Tahara.—Ber. d. Chem. Ges., xxvi, 324.

Fluorine ($C_{12}H_{13}N$).—Fluorine is the name given to an alkaloid derived from the residue after the extraction of cocaine. It is an oily liquid, heavier than water, in which it is but slightly soluble.—Pharm. Review, 1893, 19.

Dihydroxyanhydroecgonine.—Einhorn and Rassow.—Ber. d. Chem. Ges., xxv, 1394.

Hygrineoxine.—Liebermann and Kühling.—Ber. d. Chem. Ges., xxvi, 851.

ψ-Tropine and some ψ-Tropeines.—Liebermann and Limpach.—Ber. d. Chem. Ges., xxv, 927.

Tropsin.—A new local anæsthetic has recently been isolated by Giesel from the leaves of the small leaved coca-plant of Java. Liebermann has proved that this base is benzoyl *p*-tropeine, which bears no relation to the cocaine group, but is chemically closely related to atropine. It is called "tropsin" for brevity. Schweigger, of Berlin, after several months' experience with tropsin in eye surgery, reports that: (1) A three per cent. solution produces complete corneal anæsthesia more rapidly than cocaine. Iridectomy could be done painlessly two minutes after putting three drops into the eye. (2) Anæsthesia lasts from three to six minutes for each instillation, and no further prolongation can be produced save by a fresh dose. (3) Mydriasis is absent, or but slight. (4) Ischæmia never occurs, but sometimes there is a passing slight hyperæmia, and a little smarting unless normal saline solution be used as a solvent. (5) No injurious symptoms were ever observed. (6) In the removal of foreign bodies, tropsin seems, from its quicker action, far preferable to cocaine. Dr. Silex, assistant in the Polyclinic, has obtained similar results.—Chem. and Drug., 1892, 252.

Tropacocaine renders valuable service as a local anæsthetic, according to Dr. Hugenschmidt in Semaine Médicale. He uses tropacocaine 0.10 Gm. and distilled water 2.50 Gm., of which preparation ten drops are used for an injection. The advantages of its use as compared with cocaine are, (1) in a dose sufficient for producing anæsthesia it is much less toxic than cocaine, and its action on the vital functions is but little marked; (2) it produces local anæsthesia more rapidly and is more profound than cocaine, while it is of an equal duration; (3) the solution of tropacocaine for anæsthetic injections can be preserved for several months by reason of its antiseptic nature, while cocaine shows signs of decomposition and loss

of analgesic properties after four or five days.—Nouv. Rem., Feb., 1893, 56; Am. Jour. Pharm., 1893, 228.

Benzoyl-Pseudotropeine (Tropacocaine?).—This base occurs associated with cocaine, cocamine, cinnamyl-cocaine and other bases, in Java coca leaves, and to some extent in other coca leaves. It was first recognized by Giesel. Reproduced synthetically by Liebermann.

Dr. Chadbourne proposes to substitute for the name benzoyl-pseudotropeine that of "tropacocaine" as being more suited for medical use, and suggestive of the chemical relations of this base to atropine and cocaine. That name, however, would be chemically inappropriate, because the base is not an analogue of cocaine, but is really one of the class named by Ladenburg "tropeines." In the Ann. der Chem., 1892, Dr. O. Hesse has given a statement of the results obtained by him in the examination of benzoyl-pseudotropeine and the products of its decomposition, which results differ in some particulars from those of Liebermann. Liebermann stated that by the splitting up of benzoyl pseudotropine with hydrochloric acid it was converted into benzoic acid and a base which he regarded as being identical with that obtained from hyoscine by Ladenburg. Hesse has, however, found that the base produced from hyoscine has a different composition from pseudotropine, and it has been named by Hesse oscine. —Pharm. Jour. Trans., 1892, 241, 439; Am. Jour. Pharm., 1892, 579–581.

——— A. P. Chadbourne.—Brit. Med. Jour., Aug. 20, 1892; Bull. Pharm., 1892, 573.

Codeine.

Codeine.—Göhlich has published the results of his examination of several salts of this base as a continuation of the study of the phosphate and hydrochloride by E. Schmidt. Taking the formula $C_{18}H_{21}NO_3$ as representing the composition of codeine, he finds that the composition of its salts is as stated below:

Hydrobromide.....Cd.,HBr + $2H_2O$.
Hydrodide .....Cd.,HI + $2H_2O$ crystallized from water.
" .....Cd.,HI + H_2O crystallized from alcohol and ether.
Sulphate .....$(Cd.)_2H_2SO_4 + 5H_2O$.
Chromate .....$(Cd.)_2H_2CrO_4 + 5H_2O$.
Acetate .....$Cd.,C_2H_4O_2 + 2H_2O$.
Salicylate .....$Cd.,C_7H_6O_3$.
Aurochloride .....$Cd.,HCl + AuCl_3$.
Platinochloride .....$(Cd.)_2H_2PtCl_6 + 4H_2O$.
" .....$(Cd.)_2H_2PtCl_7 + 6H_2O$.
Mercuric chloride.....$(Cd.,HCl)_2 + HgCl_2 + H_2O$.

When codeine is heated to 100° C. with ethylene chloride there is no reaction. With ethylene bromide the compound $(Cd.)_2C_2H_4Br_2$ appears to be formed. The chlorocodide $C_{18}H_{20}ClNO_2$ obtained by v. Gerichten

by the action of phosphorus pentachloride, appears to be identical with the body obtained in an amorphous condition by Mathiessen and Wright by the action of hydrochloric acid. Concentrated sulphuric acid converts codeine into crystallizable sulphocodide, $C_{18}H_{20}(SO_3H)NO_2$. The isomer of codeine obtained by Anderson and by Armstrong by the action of moderately dilute sulphuric acid on codeine, is identified with the base recently described by Merck as pseudocodeine.—Phar. Jour. Trans., 1893, 805; from Apoth. Zeit., 8, 95.

Codeine Salts.—From a very elaborate investigation by W. Göhlich, having for its object the correcting and further study of the salts and other derivatives, the main results are abstracted. Codeine has the formula $C_{18}H_{21}NO_3,H_2O$; the crystallized alkaloid melts at 152–153°, the anhydrous at 155° C. The hydroiodate, hydrochlorate, hydrobromate and acetate (very soluble) crystallized from aqueous solutions with $2H_2O$; the hydroiodate crystallized from alcoholic solution with only one molecule water; the salicylate and the aurochloride (decomposed at 100°) are anhydrous; the platinochloride, according to conditions, contains either 4 or 6 H_2O; the sulphate (efflorescent) and chromate (decomposed by exposure to light), contains 5 H_2O. With mercury chloride, codeine hydrochlorate unites to form the crystallizable salt $(C_{18}H_{21}NO_3HCl)_2H_9Cl_2+H_2O$. Codeine does not unite with ethylene chloride, but unites with ethylene bromide to form $(C_{18}H_{21}NO_3)_2\,C_2H_4Br_2$. In the literature of codeine mention is made of two chlorocodides $C_{18}H_{20}NO_2Cl$ (Cl replacing OH); these have been proven to be identical; if heated under pressure with KOH both yield apocodeine, $C_{18}H_{19}NO_2$, which is a resinous mass. Cold concentrated sulphuric acid forms sulphocodide, $C_{18}H_{20}NO_2.HSO_3 + 5H_2O$; sulphuric acid with an equal volume of water assisted by heat converts codeine into the amorphous codeine of Armstrong, but this can also be crystallized and then is identical with the pseudocodeine of E. Merck; the melting point of anhydrous pseudocodeine is 180°; the hydrochlorate and hydrobromate contain between one and two molecules of water of crystallization, the sulphate $2H_2O$, the aurochloride $3H_2O$, while the platinochloride is anhydrous.—Arch. der Pharm., 1893, 235–290.

Apocodeine, having been credited by Mathiessen and Burnside, with emetic properties like apomorphine, L. Guinard (Lyon medical, May, 1893) has experimented with this medicament, and also with its hydrochloride, administering to dogs as high as 8 cgm., but without producing any emetic effects or nausea; and the result was the same whether administered by the mouth, or by intravenous or hypodermic injections.—Am. Jour. Pharm., 1893, 340. (See Proc., 1892, 690.)

Codeine—Reagent for.—A simple reagent may be obtained, according to Benezek (L'Union Pharm.), by heating to the boiling point one mallow blossom with 10 Ccm. of water. The infusion becomes a beautiful

green with codeine. This reaction may be utilized to distinguish between codeine and morphine syrups.—West. Drug., 1892, 424.

Cod Liver Oil—Alkaloids of.

Alkaloids of Cod Liver Oil.—J. Bouillot prepares the fresh hepatic tissue of the cod for microscopic examination by cutting as thin sections as possible by means of a freezing microtome, and exposing them to the vapors of hydrofluoric or anhydrous hydrochloric acid for half an hour, then submitting them to desiccation under a bell glass for two or three hours. On examination, numerous crystals of variable form are seen, localized in the extra-cellular fluid, and more especially about the periphery of the biliary ducts. It is said to be possible to distinguish amongst these the hydrochlorates of dihydrotoluidine, aselline, morrhuine, etc., whilst a section treated with platinum perchloride and then dried shows barbed needle-shaped crystals of morrhuine chloroplatinate. It would appear, therefore, that the alkaloids found in cod-liver oil exist in the hepatic tissue normally, and are not the result of any fermentative process. For medicinal use, Bouillot suggests that the alkaloids be extracted and administered as a whole. To the mixture he applies the name pangaduine, and describes it as soluble at 80° in alcohol, aqueous glycerin, etc. Its use is indicated in tuberculosis, gout, rheumatism, diabetes, and other disorders in which cod-liver oil is of use.—Pharm. Jour. Trans., 1893, 807; from Compt. rend., 116, 439.

Condurangin.

Condurangin.—L. Barthe. Condurangin is a glucoside, first obtained by Vulpius from the bark of Gonolobus Condurango, and considered by some writers as identical with vincetoxin from Asclepias Vincetoxicum. It may be separated into two parts, one of which is soluble in water, the other insoluble. The best method of preparing it, is to extract the bark with 95 per cent. alcohol in a reflux apparatus, filter, distil off the greater part of the alcohol, take up with cold water, filter again, add concentrated solution of ammonium carbonate, and heat gently. The precipitate thus formed is washed with hot water, redissolved in cold water, containing, if necessary, a few drops of alcohol, basic lead acetate added, the precipitate thoroughly washed, suspended in water, and decomposed with hydrogen sulphide; the brown solution obtained is then precipitated with a concentrated solution of common salt. The precipitate, after purification, consists of a mixture of the two modifications of condurangin. Insoluble condurangin is precipitated from a benzene solution on the addition of excess of light petroleum, as a light, almost white powder, which melts at 60–61°, and has the percentage composition $C_{20}H_{22}O_6$. Its molecular weight, as determined by the cryoscopic method, agrees with this formula.

Soluble condurangin, obtained by the evaporation of an aqueous extract of the mixed varieties, is a yellowish substance melting at 134°. It ap-

pears to have the composition $C_{18}H_{28}O_7$, but its molecular weight could not be determined. On boiling either of these compounds with acids, the principal product is a brown, pitchy substance, insoluble in water. With Fröhde's reagent, an aqueous solution of the soluble condurangin yields a greenish coloration, and after a time a flocculent, green precipitate : the insoluble variety, suspended in water, gives no reaction, or only a yellowish coloration.—Gaz. 22, 1, 236; Jour. Chem. Soc., 1892, 1352; Am. Jour. Pharm., 1892, 640.

Coniine.

Coniine.—See also Nicotine.

Coniine—A Homologue of.—Jacobi and Stoehr.—Ber. d. Chem. Ges., xxvi, 949.

Isoconiine and the asymmetrical Nitrogen Atom.—A. Ladenburg.—Ber. d. Chem. Ges., xxvi, 854.

Cotogenin.—See Leucotin.

Cystisine.

Cytisine.—The results of an extended investigation, during which attempts were made to solve the constitutional formula, are summarized as follows : The formula for cytisine is $C_{11}H_{14}N_2O$; this alkaloid occurs in numerous species of Cytisus, also in Ulex europæus; the alkaloid ulexine separated from the latter and according to Gerrard and Symons is identical with cytisine; the percentage of alkaloid in the seed of Cytisus according to researches by von Buchka and Magalhaes is very variable. Cytisine is a diacid base forming two classes of well-crystallized salts; by distillation with soda-lime a pyridine derivative was obtained beside a base $C_9H_{13}N$, which is possibly a hydro-chinoline.—A. Partheil, Arch. der Pharm., 1892, 448–498.

Cytisine and Ulexine.—A. Partheil has already stated (1891) that cytisine from Laburnum and other varieties of Cytisus is identical with Gerrard's ulexine from Ulex europæus, and that it has the formula $C_{11}H_{14}N_2O$. For the preparation of the alkaloid from either source, the pulverized seeds are extracted in a percolator with 60 per cent. alcohol acidified with acetic acid; chloroform is to be recommended for extracting the free base, but its application, in the manner described by Buchka and Magalhaës (1891), is not desirable, as an emulsion is formed. Gerrard and Symon state that a second base is present along with ulexine in the seeds of Ulex europæus, but the author failed to recognize it; he has, however, separated choline from the seeds of the Cytisus species.

Small quantities of cytisine base may be freed from the accompanying coloring matter by crystallization from boiling light petroleum; the pure base crystallizes from absolute alcohol in large, colorless, anhydrous prisms which are not deliquescent, melt at 150–153°, and are readily soluble in

water, alcohol and chloroform, less so in benzene and amyl alcohol, almost insoluble in cold light petroleum, and insoluble in pure ether. Its specific rotatory power in aqueous solution is $[\alpha]_{D17}^{\circ} = -119.57$, and analysis confirmed the formula given above. For the detection of the alkaloid, Magalhaës reaction serves; this consists in adding thymol to a solution of cytisine in concentrated sulphuric acid and heating, when a yellow coloration, finally passing into an intense red, is produced.

The author next describes a number of derivatives of cytisine, most of which are already known, and compares them with the corresponding derivatives of ulexine, thereby proving the identity of the two alkaloids.—Am. Jour. Pharm., 1893, 296; from. Arch. der Pharm., 1892, 448; Jour. Chem. Soc., Abstr., 1893, 119.

Digitalin.

Digitalin.—By H. Virliani. Hitherto the numerous attempts to obtain the pharmacologically important constituents of Digitalis purpurea in a state of chemical purity and in a crystalline condition, have been without any practical result. It has been shown by Schmiedeberg that the "digitaline crystallisée" of Nativelle was not a homogeneous substance, and in that respect resembled all the other substances which have been introduced into commerce under the same or similar names. The author, who has been engaged in the study of the constituents of digitalis for a number of years, has made the discovery of a practically applicable method for the preparation of the really active constituent of digitalis in a state of purity. With the assistance of Professor Boehm, who carried out the pharmacological testing, he arrived at the following conclusions:

1. The commercial varieties of digitalin, especially that sold as "powdered pure digitalin," contain, besides digitonin, at least two amorphous glucosides.

2. Schmiedeberg's digitalein is also a mixture, owing its effects upon the heart possibly to a distinct glucoside which has not yet been isolated, or to the presence of digitalin, which latter can be removed entirely only with difficulty.

3. Schmiedeberg's digitalin, however, is a true chemical substance, possessing the characteristic action on the heart to a marked degree.

This digitalin is now manufactured by Boehringer & Sons, according to directions of the author, and is placed on the market as digitalinum verum; it occurs as an amorphous white powder, swells in water, and is soluble in 1000 parts water or 100 parts 50 per cent. alcohol; when heated to 200° C. it remains white, but melts at 217° C, with a yellow color; it is insoluble in chloroform and ether, and is in fact precipitated by ether from its solution in absolute alcohol; its taste is but faintly bitter. As further tests of the purity of true digitalin, it is stated that a few grains, when added to 2 C.c. of 10 per cent. potassa solution should remain white at least

one minute—the presence of other amorphous glucosides at once causing a yellow coloration. The presence of digitonin is recognized by the appearance of wart-like crystals if a very thin paste of digitalin and water be mixed with amylic alcohol and set aside in a stoppered flask for 24 hours.

True digitalin is soluble in conc. hydrochloric acid with a golden-yellow color, also in pure conc. sulphuric acid, but in the latter case the color rapidly changes to blood-red. Under the influence of heat in the presence of dilute hydrochloric acid it splits up into glucose, digitalose and digitaligenin, the latter separating at once in form of pretty crystals, provided the digitalin was strictly pure.

The dose of true digitalin is placed at 0.00025 (about $\frac{1}{250}$ grain,) to be repeated every two or three hours; the unpleasant cumulative action often observed in digitalis has not been noticed in the continued administration of true digitalin, and hence must be ascribed to other bodies, such as digitonin possibly, which is said to act energetically as a local irritant.—Archiv. der Pharm., 1892, 250.

Solubility of crystallized Digitalin in Alcohol.—Adrian gives the following table of solubilities of crystallized digitalin in 100 parts of alcohol of various strengths at 60° F.:

Absolute alcohol	1.580
Alcohol of 95°	2.640
Alcohol of 90°	2.790
Alcohol of 60°	0.620
Alcohol of 30°	0.092
Alcohol of 15°	0.060

—Nat. Drug., 1892, 22.

Digitogenin—Some Derivatives of.—H. Kiliani.—Arch. der Pharm., 1893, 448.

Duboisine.

Duboisine.—Belmondo (Riv. sper. di fren. e di med. leg., through Nouv. Rem., May, 1893, p. 240) reports the results of a large number of injections of duboisine, and considers it equal to hyoscine in its sedative action, and superior to chloral as a hypnotic. He uses 0.0005–0.0015 Gm.; higher doses producing loss of appetite and vomiting.

Mazzochi and Antonini (Rif. med. through Nouv. Rem., May, 1893, p. 239) use the neutral sulphate of duboisine in the treatment of mental disorders, in doses of 0.0005–0.002 Gm., and consider both atropine and morphine inferior to this salt, in most cases a five hours' sleep having ensued about 20 minutes after the injection. Amer. Jour. Pharm., 1893, 338.

EMETIN.

Determination of Emetine in Ipecacuanha.—C. C. Keller. The fat

is first removed with ether and the powder digested with chloroform and ether. Ammonia is added and the solution containing the emetine is finally distilled; the residue dissolved in ether, dried and weighed. The alkaloid is then titrated with decinormal sulphuric acid and neutralized with centinormal potassa solution, using hæmatoxylin as an indicator. Keller found that the results obtained by weighing were always rather higher than those obtained by titration.—Schweitz. Wochensch., through Pharm. Zeit., 38, 23.

——— *Amount in Ipecacuanha.*—The percentage of emetine in the commercial drug ranged from 1.85 in selected Carthagena root to 0.54 found in a Singapore root. Rio ipecac varied from 0.65 to 1.45 per cent. emetin.—Meyer Bros.' Drug., 1893, 9.

Eserine.

Eserine Salicylate—Preparation of.—According to Nederlandisch Tijdschrift (L'Union Pharm., 1892, 401) 100 parts of eserine sulphate are dissolved in a sufficient quantity of water and precipitated by an excess of sodium carbonate. The mixture is shaken repeatedly with water and ether (free from alcohol). The ethereal liquids are united and filtered into a beaker containing 35.5 parts salicylic acid, by which the salicylate of eserine is precipitated. This is collected on a filter washed with ether and then dried at ordinary temperature away from air and light. Thus obtained, the salicylate is in very small crystals and is rather voluminous.—Am. Jour. Pharm., 1893, 16.

Eupatorin.

Eupatorin: The Active Principle of Eupatorium perfoliatum.—By C. H. Shamel. The dried Eupatorium perfoliatum, gathered at blooming-time, was extracted by hot alcohol in a continuous extraction apparatus for several hours. The excess of alcohol was distilled off and the thick residue treated with water acidulated with hydrochloric acid. A black gummy mass separated, which was removed by filtration, the filtrate neutralized with sodium carbonate and extracted with ether. On evaporation of the ether the active principle was deposited, either as a yellow resinous mass or as a yellow powder, which, on examination under the microscope, was found to consist of globular masses of needle-shaped crystals. The crystalline variety was analyzed for nitrogen, but was found to contain none. The principle, in both the amorphous and crystalline forms, was insoluble in water, in concentrated sulphuric acid and in concentrated hydrochloric acid, but was soluble in even dilute nitric acid with a light brown coloration. The nitric-acid solution, when allowed to evaporate spontaneously or in a vacuum over lime, crystallizes in beautiful prisms and six-sided plates.

An aqueous solution of these crystals injected into mice killed them in a

few hours. The crystals, when taken into the mouth, have at first an acid taste from the nitric acid they contain, followed by a very bitter taste. The aqueous solution has only the bitter taste.

Chemical Characteristics.—The crystals of the nitrate are easily soluble in water and melt at 102–103°. The principle itself does not melt, but at 250° suffers partial decomposition.

The solution of the nitrate was tested with the common alkaloid reagents, but gave the following reactions only: Phospho-molybdic acid, a green color; picric acid, a few needle-shaped crystals; auric chloride, colored slightly.

The principle is soluble in the alkalies. The solution in sodium hydroxide gave the following reactions, parallel tests being made with the sodium hydroxide solution alone: Phospho-molybdic acid, an instantaneous brilliant green coloration which soon fades; auric chloride, a black flocculent precipitate; picric acid, a deep-red coloration.

The ultimate analysis of the crystallized nitrate deprived of its water of crystallization gave the formula $C_{20}H_{25}O_{36}HNO_3$.—Am. Jour. Pharm., 511–513; Am. Chem. Jour., 1892, xiv, 224.

Fumariaceæ—The Alkaloids of.

Corydalis nobilis, Pers.—*The Alkaloids of.*—The alkaloids were extracted by treating the powdered root with 96 per cent. alcohol, evaporating and proceeding by Dragendorff's method. The root collected in summer gave 1.95 per cent. total alkaloids; collected in autumn 1.46 per cent., while the herb yielded only 0.12 per cent. Benzol extracts from the acid solution an amorphous white base, which may also be obtained in colorless crystals, and the salts of which have a bitter taste; its composition is $C_{21}H_{21}NO_6$; by oxidation, products are obtained resembling in some respects those obtained from hydroberberine, also from a base C. cava (See Proc. A. P. A., 1890, 432.). On rendering the acid solution alkaline, a brown resinous mass is separated, from which benzol extracts a base, crystallizing from boiling water in fine needles, having the formula $C_{22}H_{25}NO_5$. This corydalnobiline gives with concentrated nitric acid a blood-red color; inorganic acids form no well crystallized salts; it has a bitter taste resembling quinine. The alkaline solution obtained as above yields to chloroform several bases, of which four were obtained in crystals and distinguished as α, β, γ and δ alkaloid. Indications of the presence of hydroberberine and berberine were also obtained. The δ alkaloid, berberine and a fluorescent substance were obtained from the herb.—Ernst Birsmann (Dorpat Dissert.), Phar. Post, 1892, 1304.

Corydalis cava Alkaloids.—These, extracted from the root with alcohol, were capable of separation into two groups, the stronger and weaker bases, Of the latter group the greater portion was found to consist of corydaline,

well crystallized in large prisms melting at 135° C. A small quantity of a difficultly soluble base was obtained crystallizable in interlaced needles, melting with decomposition at 218° C.; it is probably not identical with corycavine of Freund and Josephy. Of the stronger bases bulbo-capnine was easily purified by taking advantage of the difficult solubility of the hydrochlorate; the alkaloid melts at 199°, and is distinguished from all the accompanying alkaloids by its solubility in an excess of potassium hydrate solution; bulbo-capnine is the main alkaloid, 2½ parts being present for 1 part corydaline. Second to bulbo-capnine in quantity is an amorphous alkaloid (also yielding an uncrystallizable hydrochlorate), corydine, found in the mother-liquor from the first bulbo-capnine crystallization.—E. Merck.—Arch. der Pharm., 1893, 131.

Corydaline.—Dobbie and Lauder.—Jour. Chem. Soc., 1892, 605.

Corytuberine.—This is the name applied by Dobbie and Lauder to a new alkaloid obtained by exhausting crude corydaline from Corydalis cava with hot water. It crystallizes in the form of beautiful silky needles from hot aqueous or alcoholic solutions, is soluble in cold solutions of sodium hydrate and ammonia, moderately soluble in benzene, but nearly insoluble in ether and chloroform. It begins to blacken when heated to 200°, and then slowly decomposes without melting. The aqueous and alcoholic solutions are slightly dextro-rotatory, and analysis indicates the formula as $C_{19}H_{25}NO_4$. The hydrochloride, $C_{19}H_{25}NO_4.HCl$, occurs as small rhombohedral crystals on evaporating to dryness a solution of the base in hydrochloric acid. By reacting on this salt with silver sulphate, the compound $(C_{19}H_{25}NO_4)_2.H_2SO_4$, is formed. The platini-chloride, $(C_{19}H_{25}NO_4)_2.H_2PtCl_6$, is precipitated as a pale yellow crystalline powder, slightly soluble in water, on adding hydrogen platini-chloride to an aqueous solution of the hydrochloride. The methiodide, $C_{16}H_{25}NO_4.CH_3I$, is prepared by digesting an alcoholic solution of the base with methyl iodide for several hours. —Jour. Chem. Soc., 1893, 485.

Fumarine.

Papaverine and Fumarine in a Papaveraceous Plant.—Dr. Battandier (Compt. rendus, May 16, 1892) having studied for some time the extraction of glaucine from the leaves of Glaucium luteum, L., endeavored to obtain the same alkaloid from G. corniculatum, L., var. phœniceum. He did not find glaucine, but papaverine. This latter alkaloid was characterized (1) By the violet color produced by cold monohydrated sulphuric acid, which oxidizing agents change to brown, heat to grayish green, and which is destroyed by water. (2) By the chloroplatinate crystallizing in octahedra, and (3) by its behavior towards solvents. The alkaloids of Hypecoum, Bocconia frutescens and Eschscholtzia californica give with sulphuric acid a color similar to that of papaverine, but the chloroplatinates could not be crystallized. Fumarine seems to exist in the genera and sub-genera

Fumaria, Platycapnos, Sarcocapnos, Ceratocapnos, Corydalis and Diclytra. —Am. Jour. Pharm., 1892, 404.

Geissospermine.

Geissospermine.—Freund and Favet give analyses of a crystalline alkaloid placed on the market under this name.—Ber. d. Chem. Ges., xxvi, 1084.

Gelsemium—Alkaloids of.

Gelsemium sempervirens—The Bases of.—Cushny, in Arch. f. exper. Path. u. Pharmakol. The crystallizable base named by Gerrard gelsemine, but known in Germany as "crystallized gelseminine," was prepared from the crude base met with in commerce, and it was found to possess all the characteristics described by Gerrard and Thompson. The other base for which the name gelseminine has been adopted was obtained at first in the form of a brown resinous mass. After purification it was still amorphous though free from color, but became yellow on the addition of acids. The chief result arrived at is that the physiological action of this amorphous base is very much more powerful than that of the crystallizable base. Subcutaneous injection of one milligramme produced in frogs slight narcosis which continued for some length of time, while five milligrammes of the crystalline base did not produce a very decided toxic effect. Gelseminine dilates the pupil most readily when applied locally, but at the same time causes pain and reddening of the conjunctiva, effects corresponding to those observed by Tweedy as being produced by the base to which the name "gelseminine" was applied by Wormley. The general result of Cushny's experiments is that they do not point to any useful therapeutic application of the gelsemium bases. He suggests for the crystalline base the formula $C_{49}H_{62}N_2O_{14}$, and for the amorphous base $C_{42}H_{47}N_2O_{11}$.—Pharm. Jour. Trans., 1893, 985.

Gelsemine.—L. Spiegel in Ber. d. Chem. Ges., xxvi, 1054. The author finds the melting point of the purified base to be 120° C. The hydrochloride is crystallizable, and said to be so insoluble in alcohol that it separates almost entirely when an alcoholic solution of the base is neutralized with hydrochloric acid. The hydrobromide is also crystallizable, but only the hydriodide and sulphate can be obtained amorphous. The nitrate is the most readily crystallizable salt, soluble in hot water or alcohol. The experiments undertaken to ascertain the constitution of the base and determine between the formula $C_{24}H_{28}N_2O_4$ assigned to gelsemine by Gerrard, and $C_{22}H_{26}N_2O_4$—with which the results of analysis agree as well and in some respects better—have not yet led to a decisive conclusion. The analytical data obtained do not agree with the formula $C_{22}H_{28}N_2O_4$ adopted by Sonnenschein for gelsemine. The material employed in this investigation was obtained from Trommsdorff's factory, and is known in Germany as gelseminine; it was a pale greyish brown powder, in which no crystalline

structure could be detected. It was very light and intensely bitter, readily soluble in alcohol, ether, or chloroform, and but slightly soluble in water. When the alcoholic solution was mixed with water the base separated in an oily condition, and gradually became hard without crystallizing. The melting point of this crude base was 110°–112° C.

Geoffroya Barks—Alkaloid of the.

Alkaloid of the Geoffroya Barks.—The controversy regarding the origin of these barks, which were used as anthelmintics during the last century and beginning of this century, was never decided, but gradually was forgotten with the dropping of the barks from the various Pharmacopœias. The "gray barks" of the time were undoubtedly from species of Geoffroya, whilst the "yellow barks" were just as certainly derived from a species of Xanthoxylon. Hüttenschmied in 1824, isolated from the "gray bark" an alkaloid which he called "surinamine," and which later was also known as geoffroyine; from the "yellow bark" which he believed to be G. jamaicensis was isolated an alkaloid called "jamaicine," but which later was proven identical with berberine. According to the directions of Hüttenschmied, it was possible to extract from the true bark the surinamine and confirm the tests given by him; it was also found that boiling water was the best solvent (1 : 200), that dilute alcohol dissolved less than water, and that in absolute alcohol, ether, chloroform, benzin, benzol, etc., it was insoluble. It has the formula $C_{10}H_{1}NO_{2}$, melts with decomposition at 257° C., and forms salts with most acids (none with acetic acid; nitric acid even dilute gives picric acid), the hydrochlorate decomposes on addition of water; with alkalies it gives crystalline compounds; of the alkaloidal reagents only bromine water or bromine in potassium bromide solution gives a precipitate. It was found to be identical with methyltyrosin, with angelin prepared from the resin of Ferreira spectabills and with rhatanin, a substance extracted from a commercial rhatany extract, which in all probability was adulterated with an extract from a species of Ferreira. The barks of Andira inermis and A. anthelmintica also contain this principle. It is proposed to call this principle (methyl tyrosin) andirin, and drop the names surinamine, geoffroyin, rhatanin and angelin.—O. Hiller Bombien, Arch. der Pharm., 1892, 513–548.

Helenin.

Helenin ($C_{12}H_{20}O_{2}$).—Posth has ascertained that this substance is not the anhydride of alantic acid, but has the characters of a lactone, and while it is convertible into a salt of alantic acid (m. p. 94° C.) is converted into the lactone (m. p. 76) by heating, with separation of water. The methyl ester of alantic acid when heated yields helenin and methylic alcohol. The amide yields helenin and ammonia. By the action of nascent hydrogen, helenin or alantolactone takes up two atoms of hydrogen, forming

hydralantolactone $C_{15}H_{22}O_2$ (m. p. 123° C.), from which Posth obtained salts, esters and the amide of hydralantic acid $C_{15}H_{24}O_3$ (Inaug. Dissert., Bonn, 1892, through Schimmel's Bericht).—Phar. Jour. Trans., 1893, 342.

Hydrastine.

Hydrastine—The Constitution of.—A. R. L. Dohme. An account as it was determined by M. Freund.—Pharm. Review, 1893, 222.

Hydrastine.—Freund gives, in a connected way, the results of the investigations by which the constitution of hydrastine has been determined, and also briefly describes the more important decomposition products of the alkaloid.—Ann. der Chem., 271, 311; Jour. Chem. Soc., 1893, 117.

Hydrastine and Other Alkaloids—Reactions of.—By D. Vitali. If a small crystal of hydrastine, or of one of its salts, is placed on a porcelain capsule and covered with concentrated sulphuric acid (0.5–1 C.c.), it turns yellow; and, on stirring, the liquid acquires the same color; on adding a small fragment of nitre (an excess must be avoided), the color changes to a more or less intense brownish-yellow; if a solution of stannous chloride is now added drop by drop, the solution acquires a magnificent reddish violet color, the intensity of which depends on the amount of alkaloid present. This coloration is not destroyed on dilution with water.

If a particle of hydrastine is treated with nitric acid (4 to 6 drops), the alkaloid turns yellow; on heating for an instant to the boiling point, nitrous fumes are evolved, and, on evaporating to dryness at a gentle heat, a yellowish residue is left, which, when cold, is colored brownish-yellow by alcoholic potash, and remains as a greenish-brown mass on evaporating the alcohol. When cold, this becomes deep-violet on treatment with sulphuric acid. Solutions of hydrastine must be evaporated to dryness before applying those tests which are sufficiently delicate to detect 0.0001 gram of the alkaloid.

Berberine turns blood-red on treatment as described with concentrated sulphuric acid and nitre, the color changing to green on the addition of stannous chloride.

Codeine turns dark brick-red when alcoholic potash is added to its solution after treatment with nitric acid, and coffee-colored when further treated with sulphuric acid; similarly, narcotine acquires an orange color on the addition of potash, the color changing to violet-red on adding sulphuric acid, and red to yellow on diluting with water.

A rather less delicate test for hydrastine is as follows: A particle of the solid alkaloid is fused with five or six times its weight of caustic potash, the mass allowed to cool, acidified with hydrochloric acid, extracted with chloroform, the extract evaporated to dryness on the water-bath, and the residue treated with a very dilute solution of ferric chloride; a fine, blue coloration is obtained if a few milligrams of the alkaloid have been employed; the color is destroyed by acids, and changed to brownish-red by alkalies.

A characteristic reaction for aconitine is obtained by adding to it in small quantities a solution of potassium permanganate in sulphuric acid (1 : 200) and stirring; the green color of the reagent is replaced by a violet tint, which disappears on further agitation, and is restored on adding more of the reagent, and so on. A point is ultimately reached at which the color is not affected by agitation, but at once disappears on diluting with water.

Clear indications of the presence of hydrastine in putrid animal matter cannot be obtained if the latter is treated by the Stas-Otto method, on account of the ptomaines and other impurities contained in the extract.

Hydrastine is, however, extracted from alkaline, but not from acid solutions by light petroleum, and, by taking advantage of this fact, and substituting baryta for sodium carbonate, and light petroleum for ether, in the extraction, it is possible to isolate the alkaloid in a state of sufficient purity. The author recommends the use of light petroleum in place of chloroform, ether, or amyl alcohol in the extraction of alkaloids from urine and animal remains, as they are nearly all soluble in that menstruum (the exceptions are morphine, curarine and pilocarpine) whilst ptomaines, leucomaines, pigments, and extractive matters are insoluble.—L'Orosi, 14, 405–416; Jour. Chem. Soc., June, 1892, 755; Am. Jour. Pharm., 1892, 414.

Hydrastine bitartrate, $C_{21}H_{21}NO_6,C_4H_4O_6 + 4H_2O$, recently prepared by E. Merck, crystallizes in white needles, is easily soluble in hot water, but difficultly soluble in cold water; it is of especial importance in the purification of the alkaloid hydrastine.—Arch. der Pharm., 1893, 134.

Inulin.

Inulin.—C. Tanret (Jour. Pharm. Chim., xxvii, 449), working with practically pure inulin, dried at 130° C., has obtained figures confirming those of Kiliani, who stated the formula for this substance to be $C_{72}H_{62}O_{62}$ or $(C_{12}H_{10}O_{10})_6,H_2O_2$. Inulin deposited from a non-alcoholic solution, on being powdered and exposed to a temperature of 100° for two hours, lost 10.1 per cent. of water. A further 1.3 per cent. was lost by a prolonged exposure (about two hours) at 110°–130°, the total loss thus amounting to 11.4 per cent. Anhydrous inulin has been shown by Dubrunfaut to attract water from the air powerfully, and this fact was taken advantage of by Tanret in calculating the formula of the hydrated substance, which he states to be $[6(C_{12}H_{10}O_{10})H_2O_2,6H_2O_2]_3$. Over sulphuric acid, inulin lost 7.3 per cent. of water in twenty-three days, at a temperature of 12°–15°. It is described as separating from aqueous solutions in very small irregular granules (0.0005 to 0.002 mm.), and from alcoholic solutions in larger and more regular ones, increasing in size as the proportion of alcohol is greater. The granules do not sensibly affect polarized light. When dried, inulin may resemble either starch or horn, its condition depending entirely upon the manner in which desiccation is conducted. If allowed to dry

spontaneously in the air, after washing with strong alcohol, non-adherent granules result, and the inulin may then be broken down in a pulverulent form. When alcohol is not previously used, compact transparent masses occur, which lose their transparency on coming in contact with water. One part of inulin dissolves in 10,000 parts of water at 15° with some difficulty, but in boiling water solution is very readily effected. A ten per cent. solution deposits most of the inulin, however, within twenty-four hours; less concentrated solutions depositing to an equal extent, but more slowly. Weak alcohol in the cold has no solvent effect, but dissolves about twenty-five per cent. when heated to the boiling point. Melted at 178°, anhydrous inulin undergoes profound modification, becoming freely acid and very soluble in cold water, besides having its rotatory power diminished. At a still higher temperature its rotatory power is changed in direction, and pyro-inulin is formed. Warmed with dilute acids, inulin gives rise not simply to lævulose as generally supposed, but to a mixture of about twelve parts of this with one of glucose. Its rotatory power when dried at 130° is given as $[a]_D = -39°.5$. In addition to the very sensitive reaction with baryta water, which indicates as little as one in six hundred, inulin is precipitated by lead in an ammoniacal solution, but it is not colored by iodine. As shown by Bouchardat and Dubrunfaut, it does not reduce Fehling's solution, nor is it affected by beer yeast or diastase, and it is noted that pseudo-inulin and inulenin, the two recently described bodies found associated with inulin, agree with it in these respects.

——— Since its discovery by V. Rose, in 1804, has always been prepared by precipitating it either in the cold or by means of alcohol, from its more or less clear aqueous solution. It is then subjected to reprecipitation until the product obtained is white. But this product, according to C. Tanret (Jour. de Pharm. et de Chim., April, 1893, p. 354) is far from being pure; it has a rotatory power which varies from $a_D = -31°$ to $a_D = -35°$. The author has succeeded in separating two closely resembling, but nevertheless distinct principles, which he named respectively pseudo-inulin and inulenin.

The different solubilities of these bodies in presence of baryta water in excess, affords a means of separating them from inulin and also from one another.

For preparing inulin from Jerusalem artichoke, the tubers are scraped, the pulp expressed, and the juice cleared by means of solution of subacetate of lead; excess of lead is eliminated by adding sulphuric acid, and inulin is precipitated by addition of concentrated baryta water. A second precipitate can be obtained by adding alcohol of 80 per cent.; this is principally pseudo-inulin and inulenin. The precipitates are washed in cold baryta water, dissolved in hot water, and reprecipitated. By repeating this treatment until the mother-liquor is no longer darkened by it, inulate of baryta is obtained. This is dissolved in hot water, and decom-

posed by means of CO_2, the solution is boiled, filtered, and deposits, upon addition of ¼ of its volume of 95 per cent. alcohol, pure inulin. It is thrown on a filter, washed with 60 per cent. alcohol, and dried over sulphuric acid. Pseudo-inulin is deposited from its aqueous solutions in irregular granules and from its alcoholic solutions in globules: it is very soluble in water and weak alcohol, while hot, but only slightly soluble in cold water, and insoluble in cold alcohol. It has a rotatory power of $a_D = -32.2°$, which under the influence of acids, is increased to $-85.6°$. Analysis indicates the formula $16(C_6H_{10}O_5)H_2O$.

To inulenin the author assigns the formula $10(C_6H_{10}O_5)\,2\,H_2O$. It may be procured in fine microscopic needles; dried at 100° C., it is soluble in several parts of cold water, in 35 parts of cold 30 per cent. alcohol, and in 245 parts of 50 per cent. alcohol.

——— *Fermentation of.*—E. Bourguelot. The suggestion is made that instead of using sulphuric acid to convert inulin into fermentable sugar the same purpose may be served by using artichoke tubers.—Compt. rend., cxvi, 1143.

Inulin, Pseudo-inulin and Inulenin.—C. Tanret.—Compt. rend., cxvi, 514; Jour. Chem. Soc., 1893, 385.

Ipomein.

Ipomein.—Kromer finds the root of Ipomea (Convolvulus) pandurata to contain this glucoside, being different from those of other Convolvulaceæ. It is colorless, insoluble in ether, chloroform, or petroleum ether, readily soluble in alcohol or acetic acid. Its composition is represented by the formula $C_{78}H_{132}O_{36}$.—Phar. Zeitschr. Russ.; Phar. Jour. Trans., 1893, 885.

Leucotin.

"Leucotin" and Cotogenin.—Ciamician and Silber.—Ber. d. Chem. Ges., xxvi, 777.

Lupinus Albus—Alkaloids of.

Lupinus albus—Alkaloids of.—A. Soldiani.—Gaz., 22, 177; Abstract, Jour. Chem. Soc., 1892, 892.

——— *Alkaloids of the Seeds of.*—According to Soldiani, the seeds contain a crystalline and a liquid isomeric alkaloid. The melting of the derivatives of the latter seem to indicate its identity with lupanine, from Lupinus angustifolia.—Gazz., xxiii, 143; Jour. Chem. Soc., 1893, 379. (See Proc., 1892, 640.)

Morphine.—See Opium Alkaloids.

Muira Puama.

Muira Puama—The Discovery of an Alkaloid in.—Bull. Pharm., 1892, 591.

Nettle—Alkaloid in.

Nettle—Alkaloid in the.—By Oddi and Lomonaco. The authors have isolated a crystalline alkaloid from the common nettle, which is fatal to frogs in the dose of one centigramme.—Rif. Med., B. M. J., 1642, Epit., 100; Phar. Jour. and Trans., 1892, 3.

Nicotine.

Nicotine—Constitution of.—F. Blau gives a constitution which would most satisfactorily account for its behavior, and also for that of the dibromocotinine and dibromoticonine described by Pinner, assuming that the two last-named compound have a constitution analogous to that of nicotine.—Ber. d. Chem. Ges., xxvi, 628.

Nicotine.—Pinner and Wolffenstein have obtained a compound by heating oxynicotine with hydrochloric acid which they name *pseudonicotine oxide* ($C_{10}H_{14}N_2O$). With barium oxide, *nicotine* is obtained, together with a non-volatile resin.—Ber. d. Chem. Ges., xxv, 1428. (See Proc., 1892, 778.)

Nicotine and Its Derivatives.—At the May meeting of the Berlin Pharmaceutical Society, Dr. A. Pinner presented a paper giving the results of his investigations of the bromine derivatives of nicotine (Pharm. Zeit., xxxviii, 293). On dissolving nicotine in an acid, preferably hydrobromic acid, and adding bromine to the solution, a syrupy, yellowish red fluid separates out. This is an additional product of 4 atoms of bromine to nicotine bromate. At a higher temperature bromine forms two compounds; one of which is a perbromide of a new base of the composition $C_{10}H_{10}Br_2N_2O.HBr.Br_2$, the other, the hydrobromate of a second base $C_{10}H_8Br_2N_2O_2HBr$. By conducting the process properly both these may be isolated. The author gives the name cotinine to the base $C_{10}H_{12}N_2O$, and ticoninine to that having the formula $C_{10}H_{10}N_2O_2$. Dibromocotinine, unlike nicotinine, is a univalent base. Cotinine ($C_{10}H_{12}NO$) can be obtained by pouring diluted hydrochloric acid on the perbromide of dibromocotinine and adding zinc dust. It is a fine crystalline mass, melting at 50° C., and distilling almost unchanged at 330° C. It is very readily soluble in water, alcohol, chloroform and acetone, difficultly soluble in concentrated soda solution, and is a strong monacid base.—See Ber. d. Chem. Ges., xxv, 2807; xxvi, 292, 765; Arch. der Pharm., 378–448.

Decomposition of Salts of Nicotine and the Action of Alcohol on them.—Nasini and Pezzolato.—Gaz., xxiii, 43; Jour. Chem. Soc., 1893, 444.

Nicotine—Estimation in Presence of Ammonia.—Ber. d. Chem. Ges., xxiv; Zeits. f. Anal. Chem., 1892, 348.

Coniine and Nicotine.—G. Heut.—Arch. der Pharm., 1893, 376.

Opium Alkaloids.

Opium Alkaloids—Researches on.—F. H. T. and H. Smith & Co. announce the discovery of a new alkaloid, xanthaline, which was discovered in their laboratory in 1881, but for various reasons publication has been deferred until now. It occurs in the acid mother liquids resulting from the crude hydrochlorates of morphine and codeine in the Robertson-Gregory process, and is precipitated therefrom, along with narcotine, papaverine, and many impurities, on diluting and carefully nentralizing those liquids.

The alkaloid itself is readily precipitated from the hydrochlorate by boiling with water, and is left behind as a white powder on heating the hydrochlorate above 100° C. for several hours. From a hot alcoholic solution of the salt, it is thrown down by an alkali as a white crystalline powder, insoluble in water and in alkalies, sparingly soluble in boiling spirit, more easily in benzene, and very easily in chloroform. Its melting point is 206° C. It is a weak base, but forms well-defined salts with mineral acids if these are used in excess, all these salts possessing a more or less intense yellow color. The nitrate is of a bright orange color. The formula is probably $C_{37}H_{36}N_2O_9$. Xanthaline hydrochlorate is formed by dissolving xanthaline in hydrochloric acid. This salt is stable but loses weight over H_2SO_4. If heated to about 150° C., the pure base, free from chlorine, remains. The formula is $C_{37}H_{36}N_2O_9.2HCl + 4H_2O$.

Reactions.—Xanthaline dissolves in strong sulphuric acid with a deep orange color like thebaine. It is not decomposed, however, unless heat be applied, and on standing, or more quickly on addition of water, the dark orange gives way to a pale yellow, and the sulphate of xanthaline crystallizes out in soft yellow needles. This reaction is very striking.

Nitric acid also dissolves xanthaline in the cold without decomposition, and solutions containing a large excess of dilute nitric acid can even be heated to the boiling point without decomposition. The nitrate crystallizes out on cooling in beautiful, shining, orange-yellow needles.

Hydroxanthaline.—While xanthaline shows great resistance to oxidizing agents, it is readily attacked by nascent hydrogen. If to the hot solution of the sulphate containing an excess of acid granulated zinc be added, a violent reaction sets in, following which the yellow color of the liquid is found to have disappeared. On cooling, the liquid almost solidifies into a mass of white crystals, which are a double compound containing zinc and the sulphate of another new base, hydroxanthaline.

Recrystallized from weak spirit it forms hard, white crystals, which are anhydrous, and melt at 137° C. The formula is probably $C_{37}H_{38}N_2O_9$. It is nearly insoluble in water, but dissolves very freely in alcohol, benzene, and similar solvents. It forms colorless salts, which are very soluble, but crystallize well. The least trace of this alkaloid at once forms, with strong

sulphuric acid, a deep violet solution, which becomes colorless on dilution with water, but is reproduced by adding more acid.

This color test is extremely delicate, and resembles that for cryptopine, with this difference, that with the latter alkaloid a trace of nitric acid is necessary to develop the color, while with hydroxanthaline pure sulphuric acid produces it at once.

Gnoscopine.—This alkaloid has been obtained by them in larger quantity than previously, and analyses show it to be isomeric with narcotine.

Differences between Gnoscopine and Narcotine.—That gnoscopine is a distinctly different alkaloid from narcotine is shown by its melting point, which lies at 228° C., while narcotine melts at 178° C. Further, by its slight solubility in boiling alcohol (the solubility being only about one-tenth of that of narcotine), by the characteristic slender needles in which it is almost entirely deposited from the hot alcoholic solution on cooling, and by its hydrochlorate, which crystallizes with ease from slightly acidified watery solutions in colorless flat prisms of a glassy lustre, whereas the hydrochlorate of narcotine forms hard crusts of white needle-shaped crystals.

Similarity of Gnoscopine and Narcotine.—They show identical reactions when treated with sulphuric and nitric acids, and yield the same products of oxidation when gently heated with a mixture of sulphuric acid and manganese peroxide.

Conversion of Narcotine into Gnoscopine.—The experiment of converting narcotine into isomeric gnoscopine has proved quite successful. When narcotine is heated with glacial acetic acid in a sealed tube to 130° C. for two or three hours, the liquid contents of the tube being then diluted and precipitated by an alkali, and the resulting precipitate washed with warm water, it is found that after dissolving out with hot spirit the bulk of the unchanged narcotine, a portion, which is much less soluble, remains. This residue, after complete purification, has been proved to be in every respect identical with gnoscopine as prepared from original opium liquids. —Am. Jour. Pharm., 1893, 236; from Phar. Jour. Trans., 1893, 793.

Bases of the Papaveraceæ.—König and Tietz have supplemented the investigations of this subject by G. Schmidt and others. The results obtained by them are published in a long memoir in the Archiv. der Phar., 1893, 136. From the root of Sanguinaria canadensis, which has been stated to contain only one base—sanguinarine—commonly identified with the chelerythrine occurring in the root of Chelidonium majus, they have obtained five distinct bases, chelerythrine, sanguinarine, γ-homochelidonine, β-homochelidonine, and protopine. They were unable to detect chelidonine in the root.

Protopine.—First obtained by Hesse from opium. The base obtained by Eykmann from the root of Macleya cordata and named by him "macley-

ine" is probably identical with protopine. The bases obtained by Selle from Chelidonium root and by Dankworth from Eschscholtzia californica were probably of a similar nature. The protopine obtained by G. König from the root of Chelidonium majus resembled that from Sanguinaria root in its solubility, melting point and reactions. In reference to this investigation, Schmidt points out as a remarkable circumstance, that protopine is the only opium base yet found in others of the Papaveraceæ.

Eschscholtzia californica grown at Marburg did not confirm the statement of Baudet and Adrian that it contains morphine.

Chelerythrine and Sanguinarine can no longer be considered identical in accordance with the suggestion of Schiel, as the sanguinarine hitherto known was evidently a mixture of several bases with resinous substances. —Phar. Jour. Trans., 1893, 884.

Laudanine.—Goldschmiedt says the pure laudanine, $C_{20}H_{25}NO_{11}$ contrary to Hesse's statement, is optically inactive in alcoholic as well as in acid solutions.—Abstract, Jour. Chem. Soc., 1893, 181.

Morphine.—Action of Moulds on.—Lamal, in Bull. Acad. Med. Belg., 1893; Pharm. Jour. Trans., 1893, 4.

Morphine Hydrochloride Solution.—Coloration of.—P. Welmans has drawn attention to the coloration produced when a strong solution of morphine hydrochloride is prepared with the aid of heat. He attributes the coloration to the formation of some oxydimorphine resulting from the action of atmospheric oxygen condensed in the porous mass of the salt and suddenly disengaged during solution. He therefore recommends that solutions of morphine hydrochloride should be prepared without heat and should not be made too strong.—Pharm. Zeit., 1893, 375.

Papaverinum Hydrochloricum is used in diarrhœa for children in the following form: Papaverini hydrochlorici, 0.2; Syr. Rhœados, 20.0; a teaspoonful three times daily.—Merck's Ber., Jan., 1893; Pharm. Centralh., 1893, 62.

Ouabaïn.

Ouabaïn is the glucosidal principle of the Ouabaïo plant (Acocanthera ouabaïo or the Carissa Shimperi, N. O. Apocynaceæ). It is said also to be obtained from the seed of *Strophanthus glabrus*, and has the following chemical composition, $C_{30}H_{46}O_{12}$. *Ouabaïn* is a white crystalline body, without odor, and having a slightly bitter taste; it has a melting point of 392° F. (200° C.). Soluble in hot water and in spirit, sparingly soluble in cold water; insoluble in alcohol, chloroform and anhydrous ether. The dose of ouabaïn is 1-1000 grain (0.000065 gram) every three hours, for a child five years of age.

Therapeutics.—Ouabaïn is a local anesthetic to the conjunctiva and cornea. It has been used principally as a powerful antispasmodic, and is

said to be of especial value in the treatment of whooping cough.—The Am. Therap., 1893, 163.

Picrotoxin and Picrotoxinin.

Picrotoxin and Picrotoxinin.—A. Stühlen. Pamph. Kiel: A. F. Jensen.

Pillyanine (Pillijan).

Pillyanine, the alkaloid of the South American Lycopodium Saururus, has only recently been obtained in the crystalline form as white lustrous crystals melting at 64–65° C. It is easily soluble in water, alcohol and chloroform, less soluble in ether; the salts are deliquescent and unstable. The formula for the alkaloid is very probably $C_{15}H_{24}N_2O$. By distillation in hydrogen a volatile nicotine-like base is obtained, which is probably identical with oxyamyl-nicotine. Its powerful physiological action is exerted upon the nervous system; the hydrochlorate in doses of 0.1–0.2 is capable of killing a dog. The plant itself is used in Brazil as a tænifuge.—Arata and Canzoneri (Boll. chim. farm.) Apoth. Zeit., 1892, 404.

"Pillijan;" Lycopodium Saururus.—Arata and Canzoneri give method for extracting the alkaloid pillijanine.—Gaz., 22, 146; Jour. Chem. Soc. 1892, 894.

Pilocarpine.

Test for Pilocarpine.—The hydrochlorate of this alkaloid, mixed with calomel, becomes black, if exposed to moist air, or if it be breathed upon. The same reaction is given by cocaine hydrychlorate, although the color is not so intense.—W. Lenz, Pharm. Centralh., 1893, 79.

Piperidine.

Piperidine Bases—Action of Hydrogen Peroxide on.—Merling.—Ber. d. Chem. Ges., xxv, 3123.

Piperidine Compounds.—R. Varet.—Compt. rend., cxv, 335.

——— *Oxidation by Hydrogen Peroxide.*—R. Wolffenstein.—Ber. d. Chem. Ges., xxv, 2777.

Piperidine—Action of Hydriodic Acid on.—Spindler.—Abstract. Jour. Chem. Soc., 1893, 174.

——— *Action of, on Salts of Mercury.*—Varet.—Ibid., from Compt. rend., cxv, 880.

Pseudopelletierin.

Pseudopelletierin.—Examination of this alkaloid from the root of Pomegranate.—Gazz. Chim., 1892, 514; Chem. Zeit., 1893 (Chem. Rep.), 31.

Quinine.—See Cinchona Alkaloids.

Rhamnoxanthin.—See Cascarin.

Santonin.

Santonin—Its Properties and Dangers.—F. Lascar.—Pharm. Record, 1892, 301.

——— *Reactions.*—(1) The color reaction with sulphuric acid and solution of ferric chloride, if applied as follows, will uniformly give the same result: In a test tube, dissolve the santonin in sulphuric acid, in another tube mix about one-half drop of solution of ferric chloride with one C.c. of water; upon mixing the two solutions, considerable heat is evolved, but only enough to cause a yellow color in the mixture; if the test be warmed for a few seconds by use of a spirit lamp or Bunsen burner, a fine violet coloration appears.—Stadelmann, Südd. Apoth. Ztg., 1893, 70.

(2) If santonin be heated with potassium cyanide until a fused mass results, a red color appears, changing quickly to brown-yellow; the mass dissolved in water or solution of potassa forms a brown solution showing marked green fluorescence. (3) In fusing santonin with potassium hydrate a red coloration is noticeable, becoming darker by prolonged heating; the aqueous solution of the fusion is red, but changes through brown-yellow to yellow.—J. Schermer (Nederl. Tijdschr. v. Pharm.) Apoth. Ztg., 1893, 77.

——— J. Klein.—Archiv. der Pharm., 230, 499, 675, 231, 213.

——— J. Klein.—Ber. d. Chem. Ges., xxv, 3317.

——— Cannizzaro expresses surprise that Klein still persists in thinking that santonin contains a CO group, together with three carbon atoms in the side chain.—Ber. d. Chem. Ges., xxvi, 786.

——— *Isomer of.*—Andreocci states that if a solution of santonin in concentrated hydrochloric acid be kept for several days in a stoppered vessel, at the ordinary temperature, there is deposited a crystalline substance isomeric with santonin.—Atti della Reale Accad. dei Lincei [5], ii, fasc., 7; Pharm. Jour. Trans., 1893, 3.

——— *Action of Phosphoric Chloride on.*—J. Klein.—Ber. d. Chem. Ges., xxvi, 982.

——— *Derivatives of.*—Klein replies to Cannizzaro.—Ber. d. Chem. Ges., xxvi, 1069.

——— *Derivatives of.*—Gucci and Grassi-Cristaldi.—Gaz., 22, 1, 1–55; Abstract, Jour. Chem. Soc., 1892, 869.

Santonic Acid.—L. Francesconi.—Abstract, Jour. Chem. Soc., 1892, 1352.

Santonins, Santonone and Isosantonone.—Reduction products of these.—Grassi-Cristaldi.—Gaz., xxii, 123; Jour. Chem. Soc., 1893, 110.

Santoninoxime and Santoninoximic Acids.—J. Klein, in Ber d. Chem. Ges., xxvi, 411.

Derivatives of Santonins—Fumaroid and Maleinoid Structures of some.—G. Grassi-Cristaldi.—Abstract, Jour. Chem. Soc., 1893, 425.

Santonin has been recommended in enuresis caused by irritation of the vesical sphincter, in doses of ¼ to ½ grain, given with sugar.—Quarterly Therap. Rev., July, 1892 ; Am. Jour. Pharm., 1892, 475.

Solanaceous Bases.

Solanaceous Bases—Notes Relating to the.—O. Hesse. The greater part of this paper consists of a description of well known salts of hyoscyamine, atropine and hyoscine and of a discussion of the results of the labors of other chemists on the alkaloids of belladonna.

Hyoscine has the composition $C_{17}H_{21}NO_4$ and not $C_{17}H_{23}NO_3$, as supposed by Ladenburg and Merck ; it melts at about 55° and dissolves freely in ether, chloroform and alcohol ; but it is only moderately easily soluble in water ; its specific rotatory power in alcoholic solution at 15° is $[a]_D = -13.7°$.

The author proposes that Ladenburg's pseudotropin or hydroxytropine should be called *oscine*. The composition of *oscine* is $C_8H_{13}NO_{21}$ not $C_{18}H_{15}NO$. *Benzoyloscine*, $C_{15}H_{17}NO_4$, prepared by heating oscine at 80–100° with an equal weight of water and a large excess of benzoic anhydride, crystallizes from chloroform in needles, melts at 59° and is readily soluble in ether, alcohol, chloroform and acids, and moderately easily in water. The *aurochloride*, $C_{15}H_{17}NO_4,HAuCl_4$, crystallizes in small, yellow needles and melts at 184°.

Atropamine platinochloride crystallizes in yellow scales and melts at 203–204° with decomposition.

Atropamine and Apoatropine.—The following are some of the characteristic differences between them :

Apoatropine.

Free base,	Needles,	melts at	60° to 62°
Hydrochloride,	Laminæ,	"	237° to 239°
Platinum salt,	Scales,	"	212° to 214°
Gold salt,	Long needles,	"	110° to 111°

Atropamine.

Free base,	Amorphous,	melts below	60°
Hydrochloride,	Laminæ,	" at	236°
Platinum salt,	Scales and needles,	" at	203° to 204°
Gold salt,	Brilliant laminæ,	" at	112°

As a further distinction between apoatropine and atropamine, it may be mentioned that apoatropine is produced by the action of dilute hydrochloric acid ; while atropamine is, in that way, destroyed and converted into belladonnine. Hence it is evident that, notwithstanding Merck's assertion, atropamine cannot be identical with apoatropine.

Belladonnine.—This base is readily produced by the action of baryta

water or hydrochloric acid.—Annal. der Chem., 271, 100; Pharm. Jour. and Trans., Sept., 1892; Am. Jour. Pharm., 1892, 587.

Secondary Alkaloids in Belladonna.—E. Merck shows the identity of atropamine and apoatropine. An alkaloid obtained by Roth and Ladenburg from Gehe and Co's. crude belladonnine, and boiling at 242°, as merely pseudotropine.—Merck's Jahresb., 1892.

Atropin, Apoatropin and Belladonnin.—Relation between. E. Merck.—Arch. der Pharm., 1893, 110.

Atropamine.—Merck still continues to maintain that the base to which Hesse had given the name of atropamine is identical with apoatropine.—Bericht, 1892, 1.

Hyoscyamine.—Merck finds that lævotropic acid obtained according to his experiments has not a rotatory power equal to that obtained by splitting up the inactive acid by means of the quinine salt. It does not lose its capability of crystallizing.—Bericht, 1892, 9.

Hyoscyamine Hydrobromide.—E. Merck finds that this salt dissolves in 0.34 parts of water at 15° C., and in 2.2 parts of alcohol (sp. gr., 0.820).

Hyoscine Hydrobromide requires for solution 4 parts of water and 21.5 parts of alcohol.—Bericht, 1892, 11.

Pseudohyoscyamine, a new alkaloid from Duboisia myoporoides, was separated from chloroform solution by addition of ether after first removing hyoscyamine and hyoscine as perfectly as possible by crystallization; the new alkaloid is lævogyre and forms small yellowish needles melting at 133–134° C., difficultly soluble in water and ether, easily soluble in alcohol and chloroform; it has the formula $C_{17}H_{23}NO_3$; the aurochloride melts at 176° C., the picrate at 220° C., while the platinochloride sinters at 116° and decomposes at 150°. By boiling with baryta a base isomeric but not identical with tropine and pseudotropine was obtained (the reddish yellow platino-chloride which it forms at 210° C., becomes deeper in color and at higher temperature blackens without melting), along with tropic acid.—E. Merck, Arch. der Pharm., 1893, 110–123.

Hyoscine and Scopolamine.—By Ladenburg. The author carried out a fresh series of determinations, and crystallographic measurements which have led him to the conclusion that hyoscyamine and scopolamine are not identical. The composition of the base hyoscine is represented by the formula $C_{17}H_{23}NO_3$, which is in accord with the composition of the products of its hydrolysis, viz., tropic acid and pseudotropine. Ladenburg has found that commercial hyoscine does not contain scopolamine, but he does not think that circumstance would interfere with its therapeutic application, since both bases have almost the same properties and action.—Pharm. Zeitung., xxxvii, 510; Phar. Jour. and Trans., 1892, 181.

Hyoscine (*Scopolamine*).—E. Schmidt replies to Ladenburg.—Ber. d. Chem. Ges., xxv, 2601.

Scopolamine, according to Prof. Kobert, being a mydriatic, produces physiological effects differing from those of atropine; its action on the brain is a paralyzing one, and it retards the pulse, instead of accelerating it, as does atropine. The clinical observations of Dr. Rahlmann show that the hydrochloride of scopolamine is superior to either hyoscyamine or atropine as a mydriatic, analgesic and antiphlogistic, as it does not occasion the dryness of the throat, the redness of face, nor the acceleration of pulse, observed under the influence of atropine. In glaucomatous conditions it can be injected into the eye, in solution of one or two per cent. strength.—Semaine médicale; Amer. Jour. Pharm., 1893, 340.

Scopolamine.—The alkaloid *hyoscine*, which has heretofore been considered isomeric with atropine and hyoscyamine, $C_{17}H_{23}NO_3$, really has the formula $C_{17}H_{21}NO_4$, and is identical with a base called *scopolamine* by Prof. E. Schmidt, from the fact that it was first isolated from the root of Scopolia atropoides; this is not the only source of the alkaloid, since it occurs in considerable quantity in hyoscyamus seeds and in certain duboisia leaves, in small quantity in stramonium seeds and in belladonna root. Commercial hyoscine preparations were found to consist chiefly of the salts of this base. Scopolamine, $C_{17}H_{21}NO_4+H_2O$, permanent, transparent crystals, melting at 59° C. to a colorless liquid which, upon prolonged standing does not again become crystalline; the crystals kept over sulphuric acid gradually changed to an amorphous, glassy mass, which then could not be made to crystallize again. The *hydrobromate*, $C_{17}H_{21}NO_4HBr+3H_2O$; hydrochlorate, $C_{17}H_{21}NO_4HCl+2H_2O$; *hydriodate*, $C_{17}H_{21}NO_4HI$; with gold chloride it forms an anhydrous double salt, $C_{17}H_{21}NO_4HCl+AuCl_3$, melting at 212°–214° C. (not corrected). Scopolamine is a tertiary base and is decomposed by baryta into scopoline ($C_8H_{13}NO_2$) and atropic acid ($C_9H_8O_2$). Scopoline distils at 241°–243° C. withoutd ecomposition and solidifies to a crystalline mass which, recrystallized from ligroin, forms colorless needles melting at 110° C.—Archiv der Pharm., 1892, 206–232.

Scopolamine Hydrochlorate.—A new mydriatic. It is used in solutions of $\frac{1}{16}$ to $\frac{1}{8}$ per cent., which corresponds to an atropine solution of $\frac{1}{4}$ to one per cent. strength.—Wr. Med. Bl., 1893, 137; Zeits. Oest. Apoth. Ver., 1893, 183.

Solanine.—According to Desnos (Union Pharmaceutique) solanine is a valuable remedy (similar to cocaine and chloroform water) in painful diseases of the stomach. It is adapted to individuals who easily become accustomed to morphine (hysterics and inebriates). Dose per day, 5 to 10 cgm.—Pharm. Zeit., 1892, 743.

Sparteine.

Sparteine, heated to about 180° C. in a sealed tube with excess of silver oxide and water, according to A. Peratoner, is decomposed into carbonic acid and pyridine.—Gazz. Chim., xxii, 566.

Oxysparteine ($C_{15}H_{24}N_2O$).—An oxidation product of sparteine occurring in white somewhat hygroscopic needles, melting point 83–84° C., slightly soluble in water, alcohol, ether and chloroform. The solution is strongly alkaline. From experiments on animals it seems to increase the heart's action.—Merck's Ber., Jan., 1893.

——— F. B. Ahrens. An aqueous solution of *oxysparteine* reduces Fehling's solution on being warmed with it. *Dioxysparteine* is the ultimate product of the action of hydrogen peroxide on sparteine. Trioxysparteine is obtained by the action of hydrogen peroxide on oxysparteine. —Ber. d. Chem. Ges., xxv, 3607.

Oxysparteine hydrochlorate ($C_{15}H_{24}N_2O.2HCl$), occurs in large broad needles, slightly soluble in water, melting at 48–50° C. It is used in subcutaneous injection to stimulate the heart's action. The beginning dose is 0.04 gr. and may be increased to 0.1 Gm. pro die.—Ibid.

Strychnine.

Strychnine Salts.—D. B. Dott confirms the results of G. Coull regarding the sparing solubility of strychnine acid sulphate. He finds, too, that the neutral tartrate is but little better. The tribasic citrate is more soluble (1 in 37) and the hydrochloride still better (1 in 35.5). The conclusion drawn is, that, giving due regard to solubility, stability and neutrality, the latter is the best and most useful salt of strychnine for pharmaceutical purposes.—(Brit. Pharm. Conference) Phar. Jour. and Trans., 1892, 197.

Strychnos Alkaloids.—The wood of S. Nux-vomica, according to F. A. Flückiger, yields 0.23 per cent. strychnine and 0.08 per cent. brucine; in the leaves Hooper found 0.3 per cent. brucine, but no strychnine; the bark, according to Beckurts and Vilmar, contains 1.6 per cent. alkaloid (considering the alkaloids present in equal quantities); an examination of the residue disclosed that the bark contains brucine, with only traces of strychnine.

The seeds of S. potatorum, L. fil., according to Flückiger and Maisch, contain neither brucine nor strychnine; according to the authors of the Pharmacographia Indica they contain brucine, but no strychnine; according to Beckurts and Peinemann neither alkaloid present, thus confirming the first-named investigators.—Arch. der Pharm., 1892, 549; Am. Jour. Pharm., 1893, 11.

Stability of the Strychnine Molecule.—George Welborn gives the following data showing that strychnine is not easily broken up or decomposed:

(*a*) Half a grain of strychnine was mixed with butter, and spread upon

bread, for the purpose of poisoning mice. After some days the poisoned bread was enclosed in a paper wrapper, and left for upwards of six years on a shelf in an outhouse. When the packet was eventually opened it was discovered that the bread had entirely disappeared. There was, likewise, not a trace of butter discernible, and the former contents of the packet were represented by a few small coherent lumps and the pulverulent debris of a large quantity of dead mites. On extracting these remains with appropriate solvents and subsequent purification, the color reactions peculiar to the alkaloids in question were obtained in a degree which could not have been more characteristic if the pure alkaloid had been under examination. The author adds that there was also the intensely bitter taste possessed by strychnine in the extractive above mentioned.

(*b*) A hydrochloric acid solution of the contents of a stomach, in a case of poisoning by strychnine, was evaporated to a syrupy consistence, and afterwards, during four months, exposed in a porcelain basin to direct sunlight and the dust of the laboratory. The contents of the basin were then examined for strychnine, and the beautifully evanescent play of colors so characteristic of that alkaloid obtained.

(*c*) It may legitimately be inferred from (*b*) that heating, under 100° C., with strong hydrochloric acid, as well as the presence of animal organic matter, does not break up the molecule, and also (*a*) that mites may even live in contact with strychnine.—Pharm. Jour. Trans., 1892, 440.

Strychnine.—Observations by J. Tafel, show that strychnine derivatives behave in many respects just like derivatives of tetrahydroquinoline and probably contain a tetrahydroquinoline nucleus.—Abstract, Jour. Chem. Soc., 1892, 1014.

Strychnos Genus—Alkaloids of the.—F. A. Flückiger.—Archiv. der Pharm., 1892, 343.

Nux Vomica—Location of the Alkaloids in.—J. E. Gerock and F. J. Skippari tested nux vomica seeds by soaking sections in Mayer's reagent to fix the alkaloid, washing out the excess of the reagent with water and then testing the residual insoluble alkaloidal salt with hydrosulphuric acid to form the black mercuric sulphide. Their researches seem to indicate that the alkaloids are formed principally within the endosperm cells, but not in the walls of the same.—Archiv. der Pharm., 1892, 555.

Strychnine—Discrepancies in Solubility of.—See "Incompatible Mixtures," by Hugh Kerr.

Strychnine—Large Dose of.—A man swallowed twenty grains of pure sulphate of strychnine whilst the stomach was full, and within ten minutes the man was under treatment. Apomorphine was given hypodermically and emetics of mustard and salt were administered by the mouth, previous to the use of stomach pump. Tannic acid, bromide of potassium and chloral hydrate were given as antidotes. In four days the patient re-

covered and was busy at work.—Pharm. Jour. and Trans., 1892, 84; from Brit. Med. Jour.

Strychnine Poisoning—Electro-magnetic Current in.—By J. Mackenzie. A dog had probably taken about a grain of strychnine, and presented unmistakable symptoms of strychnine poisoning; but directly the current was applied to the spinal column its beneficial effect was evident, the muscular rigidity subsiding, and at the end of four hours the dog was sufficiently recovered to be able to walk home. In subsequent experimental trials with dogs under various conditions, the same results were obtained.—(Brit. Pharm. Conference.) Phar. Jour. and Trans., 1892, 189.

Strychnine in the Brain—Presence of.—In 1882, Gay, Schlagdenhauffen and Garnier found strychnine in the brain of a subject who had died from a large dose of that alkaloid. Grandval and Lajoux have recently made a like observation (Rép. de Phar., July, 1892) in a case of slow poisoning, in which only 42 mgm. of strychnine could be obtained from the stomach. It appears, therefore, that strychnine will be found in the brain after large or small doses have been taken, and after death has taken place, either slowly or rapidly.

Strychnine and Brucine—Poisoning with.—Collin gives microscopic distinctions between the powders of the two seeds yielding the alkaloid.—Zeit., xxxvii, Pharm. 282.

Theine.—See Caffeine.

Theobromine.

Theobromine in Cacao Beans—Quantitative Determination.—P. Suss. The "shaking out" method is employed by the author in the determination of theobromine.—Zeits. f. anal. Chem., 1893, 57.

Ulexine.—See Cytisine.

Vernonin.

Vernonin—A new Glucoside from Vernonia nigritiana.—Heckel and Schlagdenhauffen.—Compt. rend., cvi, 1446; Zeitschr. f. anal. Chem., 1893, 364.

Veratrine.

Veratrine—Test for.—Instead of sugar, as used by Weppen in his color test for veratrine, E. Laves uses furfurol, the colors obtained being much purer. In a test tube 3–4 drops of a 1 per cent. aqueous furfurol solution is mixed with 1 C.c. pure sulphuric acid. Of this solution 3–5 drops are placed in a capsule and the substance to be tested applied to the edge of the liquid; a dark blue streak which changes to a green as it traverses across the acid; upon mixing the liquid a uniform dark green color re-

sults, which only after some time changes to a blue or violet.—Phar. Ztg., 1892, 338.

Crystallized Veratrine.—By E. Merck.—Veratrine crystals are identical with those of other authors called cevadine. Veratrine forms white crystals, has the formula $C_{32}H_{49}NO_9$, and has also water of crystallization, which it loses readily on exposure to the air. The dried crystals have a melting point of 202°. Sparingly soluble in alcohol and ether. The salts are altogether amorphous.—Chem. Zeit., 1893, 31.

Sabadilla—Alkaloids of.—R. Fisher. The author obtained an alkaloidal mixture which corresponded to Merck's, so-called, "crystalline veratrine." It responded to all of the tests of the U. S. P. for veratrine. Upon dissolving a part of the mass in alcohol and allowing it to evaporate spontaneously, a portion separated out on the sides of the beaker in colorless, transparent masses, which under the microscope had of a decidedly crystalline structure, though not in distinct crystals.

Upon dissolving another portion in ether and adding petroleum benzine, a precipitate was formed. The author added enough petroleum benzine (previously diluted to prevent too great precipitation) until a very slight cloudiness appeared, and allowed the mixture to evaporate spontaneously. The residue for a large part consisted of small, colorless, transparent, bead-like masses, which, when broken up, presented a crystalline appearance, and which he considered as quite pure cevadine (Merck's veratrine). They responded to the same tests as the mixture and perfectly neutralized acids, but the salts failed to crystallize. Upon adding auric chloride to the hydrochloric acid solution of the alkaloid, a heavy yellow precipitate formed, almost insoluble in water, but readily soluble in alcohol, from which, however, it failed to crystallize. The platinic salt similarly produced was much more readily soluble in water; it, too, failed to crystallize.

He tried Merck's method for the separation of a crystallizable alkaloid and obtained a product identical with Merck's veratrine. The resin-like mass left after the separation of the crystalline principle could not be obtained pure enough to warrant the belief that it really is one alkaloid, as regarded by Wright and Luff, who named it veratrine. He obtained a white alkaloid which Wright and Luff did not succeed in extracting from the alkaline extract, from which ether would remove no more alkaloid.

The amount of alkaloids obtained was about the same for either method, varying from 17 to 20 Gm. per kilo., or almost two per cent., which is a much larger yield than has been reported by any previous investigator, Wright and Luff obtaining only 0.6 per cent., while Couërbe, Schmidt and Köppen, and several others, obtained 1 per cent.

With regard to the term veratrine, different authors use it to represent altogether different substances, thereby causing considerable confusion.

Thus, the term is used by the United States Pharmacopœia to represent the mixture of alkaloids as prepared from sabadilla seed. Couërbe, who first investigated the composition of this mixture, applied the name veratrine to an amorphous alkaloid; later, Merck applied it to his crystalline alkaloid, and this term was used quite generally until Wright and Luff named the crystalline alkaloid cevadine, and mentioned an amorphous alkaloid under the name veratrine, claiming priority on account of Couërbe's researches. The terms cevadine, veratrine, and cevadalline, as used by these latter investigators, have been adopted in both the 'United States' and 'National Dispensatories,' Maisch's 'Materia Medica,' Beilstein's 'Organische Chemie,' and several other books; while Richter's 'Organic Chemistry' still applies the name veratrine to Merck's base, and mentions cevadine as identical with it.

For extracting the drug the author regards the use of any acid whatsoever in the menstruum as entirely superfluous; he considers extraction by percolation to be the most satisfactory, as long maceration and expression and subsequent percolation, though perhaps just as thorough, takes up much more time, with no visible advantages. The use of heat (the temperature of the water-bath) in evaporating off the alcohol seems to be without objection, and has the advantage that the alcohol can be recovered.—Jour. Amer. Chem. Soc., Sept., 1892.

OILS (ETHEREAL).

Ethereal Oils—A New Reagent for.—Perrot uses a solution of dimethylaniline violet in acetic acid and alcohol.—Apoth. Zeit.; Zeit. Oest. Apoth. Ver., 1892, 802.

Essential Oils—The Distillation of, and Separation from the Water.—J. F. Child gives a description of a new apparatus for the separation of oils lighter than water.—Chem. and Drug., 1893, 691.

Medicinal and Essential Oils.—Notes by P. L. Simmonds.—Bull. Pharm., 1893, 204. (See Proc., 1893, 549.)

Essential Oils—Practical Hints on.—Pharm. Era, 1892, 103; from Confect. Jour.

Oils and Esters—Saponification by Sodium Alcoholate of.—Kosel and Obermüller.—Zeitschr. f. anal. Chem., 1892, 572.

Ethereal Oils—Oxygen Compounds of.—Semmler and Tiemann.—B. d. Chem. Ges., xxv, 1180.

Ethereal Oils.—Some new esters are given in a note Pharm. Post, 1893, 183, by Schimmel and Co.

Ethereal Oils—New.—Schimmel and Co. have obtained and describe the following: Ol. Cascæ from Casca pretiosa; Ol. Ladani from gum Ladanum; Ol. Mastichis from the resin; Ol. Para-Coto, from Para-Coto bark; Ol. Winteri from Winter's bark; Ol. Coronopifoliæ from Achillea

coronopifolia; Ol. Toddaliæ from leaves of Toddalia aculeata.—Pharm. Post, 1893, 185.

Essential Oils.—H. A. D. Jowett. At a meeting of the Chemists' Assistants' Association it was suggested that no satisfactory tests of oils could be devised until two important factors were known (*a*) the action of the tests with oil of unimpeachable purity, *i. e.*, prepared by the experimenter himself from the plants. (*b*) A knowledge of the constituents of the oils. Methods might then be devised to suit each particular oil, not only to detect adulteration, but to determine the purity of the oil in question. The methods used in the detection of these foreign materials were classified and commented on as follows:

(I.) *Fractional Distillation.*—A tedious method and only capable of separating oils or liquids with boiling points separate from each other by more than 5°. The presence of CH_3OH and $CHCl_3$ may be detected in this way.

(II.) *Relative Density.*—Of little use, as the constant varies even in oils of unimpeachable purity, though it may be used in detection of large amount of turpentine oil.

(III.) *Specific Rotatory Power.*—Absolutely useless, as oils are usually mixtures of optically active bodies, and it would be very easy by judicious addition of + or — turpentine to so adulterate the oil as to give a constant approximating to the standard.

(IV.) *Color Reactions.*—Largely used in the B. P., and only of value for detecting certain impurities, of no value whatever in determining the purity of the oil.

(V.) *Index of Refraction.*—Valueless to a great extent, for the same reasons that apply to rotatory power and relative density.

(VI.) *Amount of Iodine Absorbed.*—A method which marks a step in the right direction, and is dependent on a constant observed for oils of purity described above. It would appear that this value is fairly constant for oils of recognized purity, and that it is not affected by keeping. It would seem to depend on the combination of the terpene with the iodine. It is, however, an arbitrary method, and one not altogether free from objections.

(VII.) *Determination of Free Acidity*, by titration in the usual way. Described as having a very limited application, but useful. say, in the estimation of admixture of oil of ginger grass with otto of rose.

(VIII.) *Saponification Number*, or the amount of KOH absorbed by the ester to form a potassium salt. This, in the writer's opinion, was the only method yet devised which would appear applicable to form a really satisfactory test.—Phar. Jour. Trans., 1893, 774.

Huebl's Iodine Addition Method.—D. Holde.—Chem. Zeit., 1892, 1176.

——— W. Fahrion.—Ibid., 1472.

——— Helfenberger Annalen, 1891; Pharm. Centralh., 1892, 426. (Also Chem. Ztg., 1892, 862.)

Iodine Absorption of Oils and Fats.—The method given in detail in the Proc., 1892, 553, in which it was recommended to use four times as much iodine as was likely to be absorbed, has been modified, further research establishing that twice the amount of iodine was sufficient. The modified method answering for all fats and oils is as follows: About 0.150 Gm. are dissolved in 10 C.c. chloroform, 10 C.c. each of iodine and mercuric chloride solutions are added and allowed to stand two hours; after adding 20 C.c. potassium iodide solution and 100–150 C.c. water, the excess of iodine is titrated with sodium thiosulphate solution. If in the determination it be found that the blank test requires less than twice the quantity of thiosulphate solution used in the case of the oil or fat, the determinations must be repeated, using 20 C.c. each of iodine and mercuric chloride solution for 0.150 Gm. oil or fat.—D. W. Fahrion, Chem. Ztg., 1892, 862.

——— New Method of Determining.—F. Gantter.—Zeitschr. f. anal. Chem., 1893, 181.

Terpenes.

Sesquiterpenes.—O. Wallach and W. Walker. The authors class the sesquiterpenes into two groups, those with one ethylene bond and those with two. The best known representative of the latter is the frequently occurring lævoratary sesquiterpene, which forms with two molecules of hydrochloric acid a well-defined crystallizable compound. The name *cadinene* is suggested for the hydrocarbon existing in the following oils: cubeb, savin, cade, betel, camphor, galbanum, patchouli, juniper, asafetida, coto and olibanum.

Caryophyllene, the sesquiterpene of clove oil, distils over between 250° and 260°, and its hydration was effected by adding 25 Gm. to a mixture of 1000 Gm. glacial acetic acid, 20 Gm. concentrated sulphuric acid, and 40 Gm. water, heating the whole for twenty-four hours on a water-bath. The dark-colored liquid was then distilled in a current of steam. A thin oil, of ethereal odor, was thus obtained, which separated on addition of water to the first part of the distillate. Subsequently, a less volatile oil was obtained, which solidified on cooling. After separating the oily portion by cooling and absorption, this crystalline substance was purified by redistillation and crystallization from alcohol. It proved on analysis to be the hydrate of caryophyllene, $C_{15}H_{25}.OH$, boiling at 287 to 289°, and melting at 94° to 95°. It is almost insoluble in water, slightly soluble in hot water, readily soluble in ether, alcohol, and most other solvents. In the solid state it is almost without smell, but the vapor has the odor of pine needles. The chemical characters of this substance prove it to be an alcohol. The chloride, bromide, iodide and nitrite were pre-

pared; they are crystallizable substances, optically inactive and very stable. The iodide subjected to the action of sodium yielded a crystallizable hydrocarbon, melting at 135° C., which gave on analysis results pointing to the formula $C_{30}H_{50}$, and at least showing that the treatment had given rise to the production of a hydrocarbon of high molecular weight, closely related to the terpene group.

Dehydrating agents convert the alcohol into a liquid hydrocarbon, clovene, boiling between 261° and 263°; its specific gravity was 0.930 at 18° C. Its composition is represented by the formula $C_{15}H_{24}$, but as it could not be reconverted into the alcohol it was evidently distinct from caryophyllene. Out of a large number of oils containing sesquiterpenes only one was found to yield material from which the above described alcohol could be obtained in the same manner, this being copaiba oil.

Apparently clovene has only one ethylene bond in its molecule. This cannot be affirmed of caryophyllene until its physical constants have been determined with greater certainty.

The hydrocarbon isomeric with caryophyllene, which is generally associated with cadinene in ethereal oils and differs from cadinene in not forming crystalline addition compounds with halogen acids, is certainly different from caryophyllene. It remains to be seen whether this frequently occurring hydrocarbon is related to clovene. The product obtained by dehydration of patchouli camphor, or, more correctly, patchouli alcohol, may be regarded as a distinct sesquiterpene. It appears to be related to cedrene.

For the identification of sesquiterpenes the most useful compounds will be the hydrates, which may be regarded as the alcohols of the sesquiterpene series, standing in the same relation to the hydrocarbons as terpineol does to dipentene.—Am. Jour. Pharm., 1892, 620; Ann. der Chem., Sept. 17.

Bergapten.—Pomeranz has obtained nitrobergapten.—Abstract, Jour. Chem. Soc., 1893, 342.

Carvene—Constitution of.—A. Reychler discusses the theoretical constitution of carvene and of limonene.—Bull. Soc. Chim., vii, 36.

Citrene.—This is the name under which the terpenes separated from oil of lemon, in the production of terpeneless oil, are said to be invoiced. It is suggested that this will form a peculiarly suitable adulterant for oil of lemon, and that, until the quantitative determination of citral in the oil becomes a practicable operation, there is little doubt that it is likely to be used for that preparation.—Schimmel's Bericht, 1893, 33.

Citrene—Action of Sulphuric Acid upon.—Bouchardat and Lafont. Jour. Pharm. Chim., 1893, 49. The authors find that thereby inactive polymers of this hydrocarbon are formed, the most abundant of which is *diterpilene*, $C_{20}H_{32}$. The action of sulphuric acid on the camphenes appears

to give entirely different results from those which the authors obtained with bivalent citrene, and with monivalent terebenthene.

Cymene—Synthesis of.—L. Reuter.—Apoth. Zeit., vii, 137.

Cymene from Oil of Caraway—Preparation of Optically Inactive.—L. Volpyan.—Abstract, Jour. Chem. Soc., 1893, 17. Oil of caraway was distilled and the fraction coming over at 165° to 225° collected apart and treated with sodium hydrogen sulphite and KOH in order to remove cuminaldehyde. The oil was again distilled, when each fraction of higher boiling point was found to be less dextrorotatory than the one obtained immediately before it.

Limonene Series—Isomerism in the.—O. Wallach.—Ann. der Chem., 270, 171.

Pinene—Constitution of.—O. Wallach.—Ann. der Chem., 268, 210.

——— *Nitrolamines of.*—Wallach and Früstück.—Ibid., 216.

Pinol Glycol and its Derivatives—Preparation of.—Wallach and Früstück.—Ibid., 217.

Tetrahydropinene.—Wallach and Berkenheim.—Ibid., 225.

Terpenes from Resins.—Wallach finds that copal yields, on distillation, 22 per cent. of a thin oil, boiling between 40° and 350° C. One-fourth of this, distilling between 154° and 164°, was impure pinene. The fraction distilling at 175° contained dipentene. The products of the distillation of olibanum, elemi, and colophony were of a similar nature Ann. Chem., 271, 308.

Terpenes—Aldehyds of the.—A. Etard describes camphenic aldehyd $C_{10}H_{14}O$ and camphenic acid $C_{10}H_{14}O_2$.—Compt. rend., Feb. 27, 1893.

Terpenes and their Derivatives.—J. W. Brühl.—Ber. d. Chem. Ges., xxv, 1788 and 1796.

Terpene Series—Orientation in the.—A. Baeyer.—Ber. d. Chem. Ges., xxvi, 820.

Terpenes—Aldehydes from.—Etard.—Compt. rend., cxvi, 434.

Terpenes and Allied Compounds—Studies of.—The formation of ketones by the interaction of camphor and agents such as sulphuric acid and zinc chloride. Armstrong and Kippling.—Jour. Chem. Soc., 1893, 75.

——— *The Sulphonic Derivatives of Camphor.*—Kippling and Pope.—Ibid., 548.

Terpenes and their Derivatives.—Brühl and Braunschweig.—Ber. d. Chem. Ges., xxvi, 284.

Camphors.

Camphors Containing the Group CO.CH₃.—F. W. Semmler describes *tanacetone* contained in the oils of tansy, absinthium, sage and thuja.—Ber. d. Chem. Ges., xxv, 3343.

Camphors.—Schimmel and Co. mention and describe the following products: Anethol, Anis-Aldehyd, Borneol, Carvol, Citral, Eucalyptol, Heliotropin, Nerolin I[a] cryst, Safrol, Terpineol and Thymol.—Pharm. Post, 1893, 208.

Bergamiol.—A new ester, linalylacetate is being brought into commerce as bergamiol. It is naturally a constituent of oils of lavender, bergamot and petitgrain.—Pharm. Jour. Trans., 1893, 887: from Schimmel's Bericht, April, 1893.

Carvacol—Preparation of.—A. Reychler.—Abstract, Jour. Chem. Soc., 1892, 1311.

——— Derivatives of.—Ibid., 1312.

Champacol.—Under this name Merck describes a kind of camphor obtained from champaca wood by distillation with water. After purification it melts at 86°–88° C., has the form of long white felted needles, has no odor when pure, but when kept in an impure state becomes liquid and develops the agreeable odor of champaca wood.—Arch. der Pharm., 1893, 123.

Cineol.—Reaction upon, and its occurrence in ethereal oils.—E. Hirschsohn in Pharm. Zeitschr. f. Russ., 1893, No. 4 and 5.—Pharm. Centralh., 1893, 136, Chem. Zeit., 1893, 32 and 49.

A test for cineol (eugenol), suitable for its detection in volatile oils, was discovered by E. Hirschsohn in determining the solubility of iodol in volatile oils; it was noticed that iodol was much more soluble in some oils than in others, and that in some oils a crystalline deposit was obtained in varying periods of time (one minute to twenty-four hours). The oils first giving the test contain cineol as the chief constituent, according to the investigation of Wallach; this was confirmed by using chemically pure cineol when the same compound was produced; after pouring off the excessive oil from the crystals, the latter were thoroughly washed with petroleum-ether, when a grayish green crystalline, odorless substance was obtained, rather soluble in alcohol (95 per cent.) and ether, but difficultly soluble in chloroform and benzol; the crystals boiled with aqueous alkaline hydrates were decomposed, giving the characteristic odor of cineol. This test is serviceable in examination of mixtures containing hydrocarbons, like oil of turpentine; to dissolve one Gm. iodol, 100 C.c. of turpentine oil are required: the addition of 5 per cent. cineol to the oil enables 58 C.c. to dissolve the iodol, crystals separating after twenty-four hours' standing; if 10 per cent. cineol be present, 48 C.c. will be required, crystals separating after three hours. In applying the test from 3–15 drops of the oil were agitated with 0.01–0.05 Gm. iodol. If necessary, more of the oil was added drop by drop until perfect solution resulted; the test was then set aside and examined frequently during twenty-four hours to see if crystals had separated, these then were tested for cineol

by heating with potassium or sodium hydrate solution and noting the odor. All samples of the following oils readily gave the test: Santonica, hyssop, Kuro-moji, laurel, Lavandula vera, Lavandula Spica, rosemary and sage; in the following oils some anomalies are to be noted: Absinthium, of German, French, Russian and American samples, only those of the first origin gave the test; eucalyptus, of a large number of samples examined only three failed to respond; galangal, two of three samples responded; millefolium, some Russian and German samples gave the test, but not uniformly; origanum, three of four samples yielded affirmative tests; savory, only one out of four samples responded; wild thyme, four of eight samples gave the test. By distilling the following oils (which themselves did not respond) with steam and applying the test to the first portions of the distillate, the test was also obtained; Basil, Mentha crispa and M. piperita from all sources. This modification of the test may detect cineol in oils which directly tested will not respond; the nature of the crystalline compound has not as yet been ascertained.

Coumarone—Reduction of.—H. Alexander.—Ber. d. Chem. Ges., xxv, 2409.

Eugenol in Oil of Cloves.—See Oil of Cloves.

Isosafrol—Action of Nitric Acid upon.—A. Angeli.—Gazz. Chim., 1892, 445; Chem. Zeit., 1893 (Rep.), 31.

Isoapiol—Action of Nitric Acid upon.—Angeli and Bartolotti.—Gazz. Chim., 1893, 493; Chem. Zeit., 1893 (Rep.), 32.

Geraniol in Geranium Oil.—Geraniol is the name given by Schimmel to a body which is looked upon as the essentially valuable portion of geranium oil, and which is described as having the following properties:

Boiling point 231° to 232° C., at 10 mm. pressure 112°.

Sp. gr. 0.884 at 15°. Specific rotary power: ± 0 refraction n_D 1.47734 at 19°.

The ester formation took place quantitatively.

The saponification of the ester resulted as follows:

1.69 gr. required 0.4870 gr. of KOH = 100.5 per cent. ester.

1.52 gr. required 0.4368 gr. of KOH = 100.3 per cent. ester.

1.89 gr. required 0.5320 gr. of KOH = 98.5 per cent. ester.

The ester-estimation of geranium oil by the same method yielded the following result:

1. Span. geranium oil 2.01 gr. required 0.4704 gr. KOH = 81.8 per cent. ester.

2. Reunion geranium oil 1.89 gr. required 0.4256 gr. KOH = 78.7 per cent. ester.

But as such a geraniol estimation can only lead to uncertain results, until the other constituents of the geranium oils are positively known, research into the still unknown bodies present in these oils is absolutely necessary.—Schimmel's Bericht, 1893.

Geraniol from Linalool.—G. Bouchardat states that acetic anhydride reacts with linalool at the ordinary temperature and appears to cause the formation of the corresponding ether, from which the original linalool may be regenerated, but the reaction is slow and incomplete. As soon, however, as the temperature is raised and maintained for some time at 100° to 120°, combination takes place and the rotatory power disappears, but at the same time an acetic ether is formed which is a derivative of another alcohol. This ether has a density of 0.9377 to 0.9467 at 0°, and possesses a very agreeable odor, recalling that found in the oil of Lavandula vera. Saponified with alcoholic potash at 100°, a neutral compound, $C_{20}H_{18}O_2$, is formed, which boils at 226° to 231° with slight decomposition, is totally inactive when polarized, and has a density at 0° of 0.9061. It combines with four equivalents of bromine, which it decolorizes instantly like linalool, a body being formed which is crystalline or oily according to the temperature employed. The alcohol has an agreeable rose odor, and has been proved to be identical with geraniol extracted from Indian oil of geranium.—Pharm. Jour. Trans., 1893, 3; from Compt. rend., cxvi, 1253.

Menthol.—A. Berkenheim has prepared from menthol, menthylchloride and menthene. This menthene yields a chloride which according to time of heating gives menthonaphthene and menthyliodide. Menthone was prepared as also the monochloride and dichloride. Terpin hydrate yielded an iodide, a diterpene and possibly a hydrocarbon. In this paper. the author shows that menthol is connected with the naphthalenes; the particular naphthalene obtained from it must have a ring of 6 carbon atoms, since menthol can be converted into cymene. It is also connected with the terpenes, for terpin hydrate yields an alcohol, $C_{10}H_{20}O$, much resembling menthol; and, further, from menthol has been obtained a hydrocarbon, $C_{10}H_{16}$, which possesses the properties of a terpene.—Am. Jour. Pharm., 1892, 491–494; Ber. d. Chem. Ges., 25, 686–698; Jour. Chem. Soc., 1892, 866.

American Menthol.—According to Long, this crystallizes in long needles, while Japanese menthol crystallizes in small prisms.—Jour. Amer. Chem. Soc., xiv, 149.

Menthol—Action of Sulphuric Acid on.—Tolotchko.—Abstract, Jour. Chem. Soc., 1893, 422.

Menthol—Historical and Statistical.—Chem. and Drug., 1892, Nov. 19.

Menthol in Pruriginous Skin Diseases is prescribed by P. Colombini (Gior. ital. d. mal. ven. e d. pelle, 1892, through Rev. internat. de Bibl. méd.) in one of the following forms, according to the nature of the case:

Spirit: Menthol, 5 to 10; alcohol, 100.

Oil: Menthol, 10; expressed almond oil, 100.

Ointment: Zinc oxide, 25; starch, 25; menthol, 0.50 to 3; petrolatum, 50.

Dusting powder: Zinc oxide, 10; bismuth subnitrate, 10; menthol, 1 to 3; starch, 30.—Am. Jour. Pharm., 1892, 469.

Thymol.—F. Kehrmann. A polemical paper.—Ber. d. Chem. Ges., xxv., 1662.

Dibromothymol—Derivatives of.—Pellacani.—Gazz., xxii., 584; Jour. Chem. Soc., 1893, 316.

Thymol in Dentistry.—Hartmann states (La Sem. Méd.) that thymol is as efficient a nerve destroyer for application to an exposed pulp as is arsenic, and possesses the great advantage of being non-toxic. Application of thymol to an exposed nerve cures toothache in a very short while.—Merck's Market Report.

Some American "Novelties."—Schimmel and Co. (Semi-Annual Report, 1893, 70) report on the following:

"*Ambrettaria*, a powerful synthetic product for perfumery." Although the "discoverers" claim this to be "a product of our chemical laboratory," "Ambrettaria" is nevertheless no definite scientific body at all, but a simple mechanical mixture of 5 parts of musk-seed oil (ambrette oil), 95 parts of antifebrin (acetanilid), and traces of artificial musk. These ingredients were recognized and isolated by us with absolute certainty. We determined the melting point and other characteristic features of the antifebrin.

"*Oil Catalpa*, a powerful synthetic product for perfumery." The manufacturer of this product most obligingly condescends to offer perfumers, under this new name, a terpineol, to which a few drops of ylang-ylang oil have been added, at the "cheap" rate of $10 per pound. It is to be hoped that no perfumer will fall into the trap.

"*Oil Narcissus*, a powerful synthetic product for perfumery." The person who imagines this product to provide the scent of narcissus will be sadly deceived. This stuff is nothing more or less than the parts of light specific gravity which are obtained as a by-product in the manufacture of terpineol. As this material is of no value whatever in perfumery, we used it in our works for cleaning parts of machinery. The price asked for this product is the trifling one of $7.50 per pound.

"*Oil Ylang-Ylang, artificial.*"—This product does not by any means solve the scientific problem of the synthesis of ylang-ylang in a practical manner, which would be a matter of great importance. On the contrary, we have here to deal with a bold and primitive mixture of cananga oil and Peruvian-balsam oil (cinnamein).

We are quite certain that no one could be found with sufficient assurance to try to place such products upon the European market. Any attempt to do so would only provoke mirth. And the house that dares to place such compounds before the American perfumers surely under-esti-

mates grossly the intelligence of its would-be customers.—Am. Jour. Pharm., 1893, 294.

Oil of Allium Cepa, L.—5,000 kilos of onions only yielded 233 Gm. oil, of a dark brown color, mobile, sp. gr. 1.041 at 8.7° C.; laevogyre; on exposure to freezing mixtures separating a small quantity of lustrous crystals. Distilled under ordinary pressure the oil decomposes at 160° C., emitting gases of very offensive odor; under 16 mm. pressure the oil can readily be distilled. The chief constituent is $C_6H_{12}S_2$, boiling at 75–83°, at 10 mm.; specific gravity 1.0234 at 12° C.; distillation with a little metallic potassium yields it colorless; with larger quantities of potassium there results colorless $C_6H_{14}S_2$, boiling at 68–69° C., 10 mm. pressure; by oxidation it yields carbonic, oxalic, sulphuric, propionic, formic and acetic acids. There is present also a higher sulphur derivative, which, by reduction, yields $C_6H_{12}S$. In the fraction above 100° C. is present a sulphur compound probably identical with a constituent of asafetida oil. All fractions of the oil give, with mercuric, platinic and gold chlorides, white and yellow precipitates respectively. Allyl sulphide, hexenyl sulphides and terpenes were not found in the oil.—F. W. Semmler, Archiv. der Pharm., 1892, 434–438.

Oil of Allium sativum.—From 900 kilos bulbs only 800 Gm. oil were obtained, a yield of 0.09 per cent.; the oil has a yellow color and an intense characteristic odor, and is optically inactive; sp. gr. at 14.5° C. 1.0525; exposed to artificial cold a very small quantity of minute crystals separated; upon heating to 150° C. decomposition ensues with the evolution of very offensive gases. By fractioning under greatly reduced pressure (16mm.) the following compounds were obtained: $C_6H_{12}S_2$, about 6 per cent., sp. gr. 1.0231 at 15° C., boiling point 66–69° C. at 16 mm. pressure; $C_6H_{10}S_2$ about 60 per cent. sp. gr. 1.0237 at 14.8° C., boiling at 135–139°; $C_6H_{10}S_3$ boiling at 112–122°, 16 mm. pressure; and $C_6H_{10}S_4$ boiling above 122° C., but decomposing during distillation. The compound $C_6H_{10}S_2$ purified by distillation over a little metallic potassium, boils at 78–80° C., 16 mm. pressure; it gives precitates with mercuric, platinic and gold chlorides. The oil was found free from allyl sulphide and sesquiterpene, which have been claimed to be present. Pure allyl sulphide made for comparison with these fractions is a colorless oil, sp. gr. 0.8991, at 16° C., boiling under 750 mm. pressure at 136–140° C., under 15.5 mm. at 36–38° C. All of the sulphur compounds of the oil, when distilled under ordinary conditions, suffer decomposition.—F. W. Semmler in Archiv. der Pharm., 1892, 434–438.

Almond Oil (Bitter) of High Specific Gravity—Dangerous.—The high specific gravity occasionally noted in pure bitter almond oils is due to benzonitrile, but since this latter splits up on standing with the production of prussic acid, the oils having a high specific gravity must be considered as dangerous.—Schimmel's Berichte, Pharm. Post, 1893, 297.

Oil of Mirbane.—Characteristics of a good oil, by Schimmel and Co.—Pharm. Post, 1893, 287.

Nitro-Benzol—Detection of—J. Marpurgo.—Abstract, Chem. News, 1893, 261.

Anise Aldehyde.—Must be kept in well stoppered bottles, as it otherwise oxidizes to anisic acid. The aldehyde has an odor of hawthorn.—From Schimmel's Bericht, 1893, 73.

Bergamot Oil.—For many years the examination of this oil has been limited to the determination of its physical characters, and it is only within the past year that the acetic ester of linalool has been recognized as its most important constituent. This fact pointed to a means of determining the quality of the oil, as the ester is the odorous constituent. By a saponification method, described under the head of "Lavender Oil," the normal amount of ester has been found to be about 40 per cent., and the test may be relied upon for ascertaining the quality of bergamot oil. The chief adulterations are turpentine, orange and lemon oils. All three reduce the solubility of bergamot oil in dilute alcohol, as well as the specific gravity, and, of course, the amount of ester. The presence of orange oil is also indicated by its high optical rotation. In the examination of bergamot oil, it is necessary in the first place to determine the specific gravity and the rotatory power. The alcohol test requires to be made more stringent—the oil should dissolve at 20° C., in from 1.5 to 2 volumes of 80 per cent. alcohol. Slight turbidity, increasing on addition of more alcohol, is due to separation of bergaptene; but no drops of oil should remain undissolved. Distillation of the oil under normal atmospheric conditions causes considerable decomposition, and this treatment is quite useless for the purpose of valuation. The results of a long series of experiments have proved that oil containing a high amount of ester is distinguishable from those kinds containing smaller amounts by the higher specific gravity and greater solubility in alcohol of 80 per cent. Oil of undoubted purity, pressed by Messrs. Schimmel, was found to contain more ester than any other kind, and it is probable that a perfectly pure oil is not to be met with in commerce. Experiments with mixtures of bergamot oil and turpentine, orange or lemon oils, have shown that the ester determinations may be fully relied upon, and as a minimum amount there should be 38 per cent. The specific gravity should not be under 0.881 at 15° C., and the optical rotation not more than 20° with a column of 100 mm. Practical experience has long proved that distillation of the oil is injurious, and that the much less convenient process of pressing must be preferred on that account. Experiments have shown that distilled oil contains much linalool, as a consequence of the decomposition of the ester, and by acetylating a distilled oil containing only 12 per cent. of ester the amount of ester was increased to 61.5 per cent. Even pressed bergamot oil contains some

linalool, and a sample containing 37 per cent. ester was found after acetylation to contain 47 per cent. ester. It may probably be assumed that the oil obtained by distilling the residue of the pressing operation is used for adulterating the pressed oil, and that would account for the frequently small amount of ester, as well as the low specific gravity of the commercial oil as compared with absolutely pure pressed oil.—Ber., Schimmel and Co., April, 1893; Pharm. Jour. Trans., 1893, 849; Am. Jour. Pharm., 1893, 306.

Oils of Bergamot, Lemon and Orange.—Determination of the value of, by Schimmel and Co.—Pharm. Post, 1893, 238.

Oil of Ben.—By cultivation of the Moringa aptera, a habitat of Upper Egypt and Arabia, young seedlings have been produced, which form a tuberous root, and are eaten by the Bedouins, who say that the taste is similar to the common radish.—Phar. Jour. Trans., 1892, 442; from Kew Bull., 71, 284.

Betel Oil—Composition of.—Schimmel.—Schweiz. Wochenschr. Pharm., 29, 402; Jour. Chem. Soc., 1892, 833.

Birch—Empyreumatic Oil of.—By dry distillation of Betula alba, there is obtained an empyreumatic tarry oil, known by the name of "daggett." When rectified it furnishes a slightly colored greenish oil, showing the remarkable property of dichroism. This is known in French commerce as brown oil. The empyreumatic oil is used in the manufacture of Russian leather, which owes its peculiar odor to the phenol present in it. In medicinal use it discolors the skin and finger-nails, and it has been attempted to obtain a lighter and whiter oil, by rectifying the brown oil in a current of steam; but it is questionable whether this lighter oil is as valuable therapeutically. There exists also an oil known in French commerce as Pennsylvania oil of birch, which consists largely of methylsalicylic ether.—F. Vigier, in Journ. de Pharm. et de Chim., Oct., 1892.

This latter oil is not obtained from Betula alba, but is prepared by distilling the branches of Betula lenta or sweet birch, with water.—Am. Jour. Pharm., 1893, 73.

Cedar-Wood Oil is growing in importance because of its increased use in optical work. In Schimmel's (April, 1893) report, the refractive indices of ordinary cedar-wood oil are given as $\frac{N}{D}$ 1.50567 at 17°, and condensed oil at $\frac{N}{D}$ 1.51682 at 17° C.

Cinnamon—Volatile Constituents of.—Schimmel and Co., claim that the result of Weber's examination of cinnamon-leaf oil is in full accord with their experiments with oil distilled by themselves. They further

state that the product formerly known as cinnamon-root oil likewise originates from cinnamon leaves, but that it shows a rather different composition. Safrol is present besides eugenol, whilst cinnamic aldehyde is replaced by benzoic aldehyde, and terpenes are present in larger proportion. The oil from cinnamon bark contains a large amount of cinnamic aldehyde and 6 to 8 per cent. of eugenol. The presence of safrol has not yet been established, though it probably does occur. In an examination of the terpenes of Ceylon cinnamon oil of their own distillation, Messrs. Schimmel recognized phellandrene. It is noted as a peculiarity of Cinnamomum zeylanicum that it contains quite different volatile constituents in its roots, leaves, and bark; camphor being most prominent in the root oil, eugenol in that from the leaves, and cinnamic aldehyde in the oil from the bark.—Schimmel's Ber., April, 1893.

Cinnamon Leaves—Essential Oil of.—Under the direction of Prof. E. Schmidt a further investigation of this oil has been carried out by T. Weber, and the results obtained some years ago by Stenhouse and Schaer have been in the main confirmed. The presence of benzoic acid could not be detected. The oil originally introduced into commerce as being derived from cinnamon root contains, like the oil of the leaves, eugenol; also safrol, a small quantity of benzaldehyde, and, as compared with the leaf oil, a considerably larger proportion of terpenes. If, therefore, the oil of commerce be really obtained from cinnamon root, the plant yields, in the three different organs, oils that are essentially different. If on the contrary, the oil is, as suggested by Schimmel, derived from the leaves, it is remarkable that it should contain benzaldehyde, since that aldehyde cannot be detected in the undoubtedly true oil of cinnamon leaves, though it contains cinnamic aldehyde. The presence of a larger proportion of terpenes, as well as safrol, may be indicative of an adulteration of the oil, carried out at the place where it is produced.—Archiv. der Pharm., xxx, 232.

Cinnamaldehyde in Oil of Cassia—Estimation of.—Schimmel (Abstract, Jour. Chem. Soc., 1892, 924). 10 C.c. of the oil is heated in a small flask on the water bath and solution of sodium hydrogen sulphite is added in small portions, time being allowed between each addition for the mass, which at first forms, to liquefy again. Time required, 10–15 minutes.

Cassia Oil.—The previous reports have furnished ample information as to the source and preparation of this oil, but there is still some uncertainty as to the conditions influencing its quality. Oil containing only from 45 to 55 per cent. of cinnamic aldehyde has again come into the Chinese market, and it is stated to be absolutely pure. This deficiency is accounted for by the statement that young and imperfectly ripened material always yields such oil. On examination, Messrs. Schimmel found that the oil was not to be distinguished by its external appearance and characters

from oil of the best quality. It did not contain rosin, fat, oil, petroleum, or any of the coarser adulterants. This oil has been rejected by the Hong Kong merchants, but some of it has found its way to India and places where low price is the chief attraction and there is but little appreciation of quality. The explanation given by the Chinese of its inferior character cannot be summarily rejected, since it is possible that young leaves may contain a considerable proportion of the acetic ester of cinnamyl (C_9H_9.-OAc), and that cinnamic aldehyde may be formed from that by oxidation during the growth of the plant. But it is more probable that this inferior oil is derived from other parts of the plant, or from another species of the genus of Cinnamomum. Messrs. Schimmel remark that the previous history of this subject furnishes no inducement to believe the statements made by the Chinese, and they reserve their opinion until they shall have examined the raw material from which the inferior oil is obtained. Meanwhile, they recommend that the determination of cinnamic aldehyde should be made the test of quality in purchasing the oil, and they state that the oil imported since last October has been found to contain at least 85 per cent. and sometimes as much as 94 per cent. of cinnamic aldehyde. —Ber., Schimmel and Co., April, 1893; Pharm. Jour. Trans., 1893, 849; Am. Jour. Pharm., 1893, 305.

Cloves—Eugenol in Oil of Cloves—Estimation of.—J. C. de la Cour calls attention to the method proposed by H. Thoms (Pharm. Centralhalle, 1891, 589). In performing the experiment, the author suggests to pour into the tared beaker containing the oil, simultaneously from two separate vessels, the sodium hydrate and benzoyl-chloride, and then stir with a glass rod. The results obtained were as follows:

		Specific Gravity.	Eugenol. Per cent.
(1)	Oil of cloves, distilled by author	1.0675	77.96
(2)	" commercial	1.0514	78.74
(3)	" "	1.0502	75.08
(4)	" "	1.0483	72.26
(5)	" "	1.0490	74.22
(6)	" old, distilled by J. P. Remington	1.0752	75.74
(7)	Oil of clove stems, distilled by author	1.0552	87.10
(8)	" commercial	1.0441	80.34
(9)	" "	1.0452	77.78

These results agree with the observation of Dr. Thoms that the specific gravity has no uniform relation to the percentage of eugenol present, and that, besides the eugenol and terpene, probably a third compound is present in the oil which may account for the variation.

It will be observed that all the commercial samples are rich in eugenol, also that the oil of clove stems, although not so fragrant, shows a rather larger percentage of eugenol.

According to the semi-annual report of Schimmel & Co. (April, 1892, p. 20), the method yields concordant results within the limits of 1 per cent., but is not suitable as a practical pharmacopœial test on account of the time its execution occupies. While the suggestion of Thoms, that a minimum percentage of eugenol in clove oil should be a pharmacopœial requirement in the future, is well worthy of consideration, it is suggested by that firm that eugenol be employed in place of oil of cloves, since the former can be prepared in a state of purity without difficulty, and its purity easily determined. For the latter purpose it is only necessary to observe the specific gravity (1.072 at 15° C.) and boiling point (253–254° C.), and to ascertain that it forms a clear solution in potash solution of 2 or 1 per cent.—Am. Jour. Pharm., 1892, 508–510.

Eucalyptus Oils—The Constituents of.—H. Helbing and F. W. Passmore endeavor to harmonize the conflicting statements concerning the chemical composition of these oils.—Bull. Pharm., 1892, 301.

Eucalyptus Oil—A Crystalline Dihydrochloride from.—Anthoine.—Abstract, Jour. Chem. Soc., 1893, 223.

Eucalyptus Oils.—A contribution to the knowledge of 12 of these oils by Schimmel and Co. in Pharm. Post, 1893, 273.

——— Helbing's. Pharmacol. Record, June 1892; Pharm. Centralh., 1892, 464.

Eucalyptus Oil Industry as carried on at Bendigo (Otherwise Sandhurst), Victoria—Notes on the.—J. H. Maiden.—Bull. Pharm., 1892, 607.

Oil of Eucalyptus—A Crystallized Derivative from.—Lafage Bull. gén. de Thérap., 1892, 316.

Oil of Geranium—Physiological action of.—Cadeac and Meunier.—Province méd., Lyon, 1892, 289.

Kurmoji Oil.—This essential oil is obtained from Lindera sericea, a plant indigenous to Japan. It has been chemically examined by W. Kivasink.—Archiv. der Pharm., xxx, 265; Phar. Jour. and Trans., 1892, 6.

Oil of Laurel Leaves—Bayberry—Oil of Bay—Bay Rum.—C. S. Ashton. Notes on the Origin of.—Chem. and Drug., July, 1892, 20.

Oil of Lavender and of Bergamot.—Bertram and Walbaum consider the chemistry.—Jour. f. prak. Chem., xlv, 390.

Lemon Oil.—As the general result of further investigation, it has been found desirable to apply tests of increased stringency in judging of the purity of this oil. The determinations of optical rotation and specific gravity are of special importance; since the admixture of turpentine oil—

almost the only adulterant—has the effect of reducing the rotatory power and increasing the specific gravity. By comparison of a number of samples with oil of known purity, expressed by Messrs. Schimmel, it appears that pure lemon oil of good quality should have a specific gravity of 0.858 to 0.859 at 15° C., and an optical rotation not less than + 60°, with a column of 100 mm. But these data are by no means sufficient indications of quality, which can only be determined satisfactorily by ascertaining the amount of citral present. It has not yet been possible to do that; but Messrs. Schimmel are endeavoring to devise a method suitable for that purpose, and they have reason to believe that they will succeed. In reference to the recently established production of a concentrated lemon oil—wholly or partially deprived of terpene—a question is raised as to what may be expected to become of the by-products of that operation, consisting of a mixture of pinene and limonene, possessing some lemon odor, but almost destitute of citral.

Sweet Orange Oil.—Similar observations of the characters of this oil have been instituted, and the conclusion arrived at is that it should have a specific gravity of .850 at 15° C., and a rotation of at least 95°. Addition of turpentine to the oil reduces the rotation and increases the specific gravity.—Ber., Schimmel and Co., April, 1893; Phar. Jour. Trans., 1893, 849; Am. Jour. Pharm., 1893, 307.

Turpentine Oil in Lemon Oil.—Oliveri (Gazetta chim. ital., xxi, 318, through Rép. de Pharm., 1892, p. 221) examining oil of lemon for adulterations, uses a polarimeter of Laurent with a 20 c.m. tube. The rotatory power for pure lemon oil is + 120° and for turpentine — 55°. The rotatory power of mixtures is seen from the following table:

2	parts of	turpentine	in 100	= 116°.5
4	"	"	"	= 113°.00
6	"	"	"	= 109°.5
8	"	"	"	= 106°.
10	"	"	"	= 102°.5
15	"	"	"	= 93°.75
18	"	"	"	= 88°.50
20	"	"	"	= 85°.00

The examination is made at ordinary temperature, 15–20° variation having no effect on the observations.—Am. Jour. Pharm., 1892, 403.

——— *To Remove the Turpentine Taste from.*—Take for each pound of oil thirty grains of potassium permanganate and dissolve in a small quantity of water. Now add the solution, a little at a time, to the oil of lemon, shaking the bottle well between each addition. Continue to shake at frequent intervals throughout the day, and then draw off the oil from the solution. Finally, wash the oil by shaking it up a few times with a little warm water, and then decant into a fresh bottle.—Pharm. Review, 1893, 59.

Essence of Lemon.—Mr. Arthur A. Barrett describes the manufacture of this essential oil as it is carried on in Sicily. He pointed out in the first place that the statement to be found in most books as to the use of the écuelle for this purpose is incorrect at the present time. The sponge process is now generally adopted in Sicily. In regard to the quality of the essential oil, it appears from Mr. Barrett's account that considerable differences may exist when the purity of the oil is undoubted, and that much depends on the condition of the fruit used and the time when the oil is made. Adulteration with turpentine, specially refined for that purpose, appears to be frequently practised, and to a very large extent. According to Mr. Barrett, English wholesale druggists are supposed to buy oil of low quality, the greater part of which is said to go to London, Manchester and Glasgow. The addition of turpentine is said to be secretly practised by the workmen engaged in the extraction of the oil; so that it is difficult for manufacturers to know whether the oil they make is really pure. The methods in use for testing the quality of lemon oil appear to be extremely crude, and to consist chiefly in reliance upon the sense of smell.

Concentrated Oil of Lemon.—Mr. A. A. Barrett has for some time been directing his attention to the separation of that portion of lemon oil to which the flavor is due from the terpene with which it is naturally associated. As in the case of many other essential oils, the terpene constituting the chief bulk of lemon oil is comparatively destitute of taste and odor. The characteristic taste of the essential oil of lemon belongs to a small proportion of another body which has a higher boiling point than the terpene, and also a higher specific gravity than ordinary lemon oil. Mr. Barrett does not give any information as to the chemical nature of the concentrated lemon oil, nor does he state how it is prepared, though it may be assumed that the method adopted is careful fractional distillation. The advantages of the article are said to lie mainly in its ready solubility in weak spirit, and its greater suitability as a flavoring material in the manufacture of aërated beverages. Mr. Barrett points out that the specific gravity of the concentrated oil is its most important characteristic. It should not be less than .900 if the whole of the terpene has been removed. —(Brit. Pharm. Conference.) Pharm. Jour. and Trans., 1892, 251–253.

Essential Oil of Licari Kanali.—Barbier considers the substance obtained by Morin from the essential oil. The present author terms it *licareol.*—Compt. rend. cxiv., 674.

Mosula japonica (*N. O. Labiatæ*)—*Ethereal Oil of.*—Shimoyamo and Ono have found that the ethereal oil of this plant, amounting to 2.13 per cent., contains thymol to the extent of 44 per cent. The liquid hydrocarbon associated with thymol gave by repeated fractionation a small

quantity of an oil that had an odor resembling cymene.—Apoth. Zeit., vii, 439.

Oil of Mustard—Estimation of.—A. Schlicht proposes a modified method.—Zeitschr. f. anal. Chem., xxx, 661; Jour. Chem. Soc., 1892, 1035.

Nerolin I^a Cryst.—A substitute for Oil of Orange Flowers.—Pharm. Centralh., 1893, 100.

Oil of Niaouli.—This oil is a distillate from Melaleuca viridiflora, and, according to Dr. A. Kraus ("L'Union Pharmaceutique," 1893, 1), at 14.5° C. it is of sp. gr. 0.929 and sp. rot. pow. + 9° 44′ in 200-mm. tube. It begins to distil at 169° C., and all but 3 to 7 per cent. distils between that and 295° C. Dr. Kraus carefully fractionated the oil, and found that the fraction distilling between 170° and 180° C. (which constitutes from 21 to 46 per cent.) gave all the characteristics of cymol, $C_{10}H_{18}O$. Above 270° C. a sulphone was obtained.—Chem. and Drug., 1893, 737.

——— G. Bertrand (Compt. rend., cxvi, 1070; Pharm. Jour. Trans., 1893, 989) describes it as having a density of 0.922, and deviating a ray of polarized light 0° 42′ to the right. By adding to it successively solutions of potash and of sodium bisulphite, and resorting to saponification, the presence of a trace of valerianic acid was indicated, as well as small proportions of benzoic aldehyde and valerianic ether. On distilling, four-fifths of the oil pass over below 180° and may be divided into two fractions, one of which boils at 155°–156°, and the other at 173°–175°. The first is a terebenthene, having, after distillation with sodium, a density of 0.865 and rotatory power $[a]_D = + 36° 03′$. Its formula is $C_{10}H_{16}$, and with hydrochloric acid gas it forms a crystalline monochlorhydrate having, in alcoholic solution, a rotatory power $[a]_D = + 25° 09′$. The second fraction is a mixture from which, at a temperature below — 6°, a crystalline mass can be separated. The purified crystals appear to consist of eucalyptol. They melt at 1° to a liquid of camphoraceous odor, optically inactive, and boiling at 175°. The specific weight of this eucalyptol is 0.930 and its vapor density 5.28 (calculated 5.34 for $C_{10}H_{18}O$). Treated with very dry hydrochloric acid vapor an unstable crystalline compound is formed, having the composition $(C_{10}H_{18}O)_2HCl$. Water instantly decomposes this into its original components. The liquid from which the crystals have been separated has a lemon odor, and is apparently a mixture of eucalyptol and a hydrocarbon of the formula $C_{10}H_{16}$. Its density is 0.917, and optical activity $[a]_D = — 4° 10′$. The fraction distilling above 180° forms a syrupy liquid, boiling about 220°, and yielding a small proportion of crystals at — 50°. By using one of these crystals as the starting point, crystallization may afterwards be readily induced in the re-

maining liquid, taking place rapidly at the ordinary temperature. The solid substance, dried in vacuo, melts only when a temperature about 30° is attained, the syrupy liquid then formed having the formula $C_{10}H_{18}O$, boiling at 218°, and presenting all the characteristics assigned by Bouchardat and Lafont to the terpineol synthesized by them (Comp. rend., cii, 1555), except that it is feebly lævorotatory $[a]_D = -2° 10'$, whilst the synthetic terpineol was inactive. Finally, there remains in the apparatus after distillation a small quantity of resinified matter of a greenish color. Neglecting the secondary products, M. Bertrand arrives at the conclusion that the essential oil of M. viridiflora consists, apart from the dextrorotatory terebenthene, $C_{10}H_{16}$, of a mixture of three bodies, eucalyptol, a hydrocarbon (probably citrene) boiling at 175°, and a terpineol. This composition is identical with that of the terpinol of List (Comp. rend., civ, 996; cvi, 663), obtained by heating with acidulated water, the terpine, $C_{10}H_{16},2H_2O$, resulting from the spontaneous hydration of terpenes, $C_{10}H_{16}$, the natural product being thus readily imitated artificially in the laboratory by extremely simple reactions. Referring also to the fact that Bouchardat obtained a citrene by heating the valerylene derived from amylic alcohol, the author states that he has found it possible to extract small quantities of amylic alcohol from portions of the oil examined by him, that passed over about 130°, when separating the terebenthene. He has found similar traces in the oils of cajeput and eucalyptus.

Oil of Paracoto Bark.—Paracoto bark yields by distillation an essential oil which has been examined by Wallach and Reindorff. They find in it a sesquiterpene and the methylester of eugenol $C_6H_3.C_3H_5.(OCH_3)_2$. The hydrocotoin of Ciamician and Silber, having the formula $C_6H_2.(OCH_3)_2.OH.COC_6H_5$, closely resembles methyleugenol, they think. They have also studied alpha, beta, and gamma paracotol, isolated by Jobst and Hesse, and regard them as mixtures of sesquiterpene and methyleugenol. Alpho-paracotol they regard as a natural isomeric hydrate of cadinene ($C_{15}H_{24}$) which is found in patchouli, sage, and galbanum oils. If that is so, the formula should be $C_{15}H_{26}O$, not $C_{15}H_{24}O$, as stated by Jobst and Hesse. —Chem. and Drug., 1893, 737.

Peppermint Oil—Russian.—This oil has been chemically examined by G. Andres and A. Andreef; they find that 17 volume per cent. of the oil is made up of the hydrocarbons lævo-limonene, menthene and pinene; the lowest-boiling fraction gave indications of a naphthylene $C_{10}H_{18}$. Experiments were also made proving that the distillation of the fresh and the air-dried herb gave identical products. The chief constituents of the oil are menthol and menthone.—Ber. d. Chem. Ges., 1892; Pharm. Ztg., 1892, 405.

The Oil of Mentha Pulegium, Linné, according to P. Barbier (Compt. rend., cxiv, 126), contains as its chief constituent puleone, $C_{10}H_{16}O$, which has a strong mint-like odor, and at 23° C. the spec. grav. 0.9293, boils at 222°, is dextrogyre, and by chromic acid is oxidized to carbonic and acetic acids and silky needles of $C_7H_{12}O_4$ which are probably identical with propylsuccinic acid. Puleone is energetically acted upon by bromine with the evolution of HBr. It combines with hydroxylamine, yielding colorless puleonoxime $C_{10}H_{16}.NOH$, having a strong odor and boiling at 170° C.—Am. Jour. Pharm., 1892, 367.

Pine Needle Oil.—J. Bertram and H. Walbaum. The authors have examined some of the oils obtained from the needles and young shoots of various Coniferæ.

It has been ascertained that in almost all kinds of pine-needle oil esters of borneol are present, chiefly the acetic ester, and this may be regarded as the substance to which the peculiar pine odor is due. The particular character of these oils is determined also by the presence of different terpenes. Among these there have been found lævopinene, dextropinene, lævolimonene, dipentene, phellandrene, and sylvestrene. Most of the oils also contain the sesquiterpene named by Wallach cadinene.

The oil of Abies pectinata, D. C., is extracted in Switzerland and the Tyrol from the needles and young shoots of the pine. It has a very agreeable refreshing odor, and is therefore largely used as a perfume.

The oil has a specific gravity of 0.875, at 15° C., and it is lævorotatory for a column of 100 Mm. = 20°40′.

Distilled under ordinary pressure, 8 per cent. passes over between 158° and 170°, 55 per cent. between 170° and 185°; decomposition then commences, since the bornylacetate present can be distilled only in vacuo or by the aid of steam.

Naturally the boiling point of an oil liable to undergo decomposition by heat cannot give any indication of its composition. In this instance the liberated acetic acid converts part of the terpene into dipentene, terpinene, and polymeric products, by which the boiling point is raised. A determination of the boiling point serves, however, to distinguish genuine oil from those kinds which consist chiefly of turpentine oil, and therefore distil over completely below 170° C.

It consists of pinene, lævolimonene, lævoborneol and sesquiterpene.

The authors operated upon oils from young cones of Abies pectinata, from the needles and young branches of the hemlock spruce (Larix), Picea vulgaris, Pinus pumilo, and an oil produced from the needles of Pinus silvestris. As a general result of these observations it appears that the different kinds of pine-needle oil contain pinene. The oils from Abies and Picea contain chiefly the lævo modification, while those of the ordinary fir contain dextropinene.—Pharm. Jour. Trans., 1893, 967; from Arch. der Pharm., 1893, 270.

Pine Oil.—Messrs. Schimmel have examined several samples of the oil met with in commerce, comparatively with oil that is undoubtedly genuine, and they have found that in some instances the commercial oil was nothing more than ordinary turpentine scented with acetic ether, or mixed with a small proportion of true pine oil. The genuine oil differs from these imitations in containing a considerable portion of oil which boils above 185°. This cannot be distilled without decomposition, except by the aid of steam, and it is considered to be of the nature of an ester, to which the oil owes its agreeable smell. The portions of highest boiling point yielded on saponification lævo-borneol, having a melting point of 206°, and fat acids, chiefly acetic. Another constituent of the genuine oil is lævo-pinene, while the spurious oil yields dextro-pinene, thus showing that it has been prepared with American turpentine. The oil of *Pinus Picea* and that of *Abies canadensis*, resemble genuine pine oil in containing lævo-borneol and lævo-pinene. The former also contains limonene. Another oil, said to be obtained from the green cones of *Abies excelsa*, did not contain borneol, but consisted almost entirely of lævo-pinene and lævo-limonene. By fractional distillation the great difference of commercial samples may be ascertained, as will be seen from the following tabular statement of results obtained in that way. The genuine oil yields only a small portion, distilling under 170° (lævo-pinene), and there remains a considerable portion boiling above 185°, consisting chiefly of borneol acetate and other esters of borneol. Lævo-limonene must also be regarded as an essential constituent of pine oil.

	150°–170°.	170°–185°.	Residue.	
GENUINE PINE OIL.				
From Picea vulgaris, Lk., sp. gr. 0.933 at 15°, rotatory power —23°	17 p.c.	33 p.c.	50 p.c.	contained borneol.
Pinus picea, sp. gr. 0.875 at 15°, rotatory power —58.40°	8 "	55 " cont'd limonene.	37 "	
Abies canadensis, L., sp. gr. 0.907 at 15°, rotatory power —20.54°	11 "	37 "	52 "	
Pinus pumilio, Haenke, sp. gr. 0.865 at 15°, rotatory power —9°	0 "	70 "	30 "	
Abies excelsa, Lk., sp. gr. 0.854 at 15°, rotatory power —72.40°	16 "	76 " cont'd limonene.	8 "	
COMMERCIAL SAMPLES.				
I.				
Rotatory power + 14°	96 "	1 "	3 "	
II.				
Sp. gr. 0.873 at 15°, rotatory power + 4°	95 "	1 "	4 "	
III.				
Sp. gr. 0.868, optically inactive	100 "	—	—	

—Pharm. Post, 1892, 1072.

Oil of Roses—Ethyl Alcohol in.—T. Poleck. Oil prepared in Germany,

on the spot where the roses were grown, was found to contain no ethyl alcohol. That previously found in other samples must have been formed by fermentation taking place in the leaves during their transportation to the factory.—Ber. d. Chem. Ges., xxvi, 38.

——— *Oil of Geranium in.*—Panajotow (Bulletin de la Société Chim., May 20, 1892) gives the following tests for the detection of oil of geranium in oil of rose: (1) To 2 C.c. of bisulphite of rosaniline, obtained by decolorizing fuchsine with sulphurous acid, are added two or three drops of the oil. If the oil is pure, it slowly (within twenty-four hours) assumes a red color; should it, however, contain oil of geranium, it is rapidly (in about two hours) colored blue; (2) Concentrated sulphuric acid yields with oil of geranium a brown mass which is not entirely dissolved by 95 per cent. alcohol, the solution being red and the flocculent particles yellow. Oil of rose treated in like manner yields a mass which is entirely soluble in alcohol, the solution being colorless.—Am. Jour. Pharm., 1892, 569.

——— *Production of in 1892.*—The following table gives the amount, in kilograms, of oil of rose produced in the several districts of Turkey during 1891 and 1892:

Districts.	1892.	1891.
Kizanlik	458½	622
Strema	465	595½
Sarnagora (Brezovo)	148½	205
Stara-Zagora	42	58
Dutchehlin	58	59
Novo-Zagora	36	51
Tchirpan	33½	55½
Pechtera	89	79
Total	1,310½	1,725

The next table gives the amount of roses, in kilograms, distilled in these several districts during the past two years:

Districts.	1892.	1891.
Kizanlik	1,643,000	1,752,000
Strema (Karlova)	1,674,200	1,850,000
Sarnagora (Brezovo)	561,600	596,900
Stara-Zagora	129,700	144,000
Dutchehlin	127,500	145,700
Nova-Zagora	112,300	130,500
Tchirpan	102,900	135,200
Pechtera	270,000	220,000
Total	4,621,200	4,974,300

—Pharm. Era, 1893, 226.

Oil of Roses.—Production by Messrs. Schimmel and Co—Pharm. Jour. Trans., 1892, 353. In the distillation of roses which are conveyed considerable distances, a considerable quantity of alcohol is obtained in the product. The origin of this alcohol is supposed to be due to a process of fermentation, occurring during the transportation of the roses. In distilling the roses which have been freshly gathered no alcohol has been obtained, and the oil is found to contain much less stearopten than that formerly produced. Messrs. Schimmel are now making rose water of two strengths, one corresponding to two kilos of leaves to one kilo of water and the other of triple strength, for convenience of transport.

Oil of Sandalwood, Adulterated.—By M. E. Mesnard. Pure oil of sandalwood with sulphuric acid forms a viscid liquid which becomes pasty and is rapidly transformed into a solid mass adhering to the glass. This mass is easily recognized by its light grey-blue or greyish color and the dusty appearance it assumes with age. In adulterated specimens the resinous mass does not solidify entirely, and remains of a deep tint with a very distinct lustre.—Compt. Rend., cxiv, 26, 1546; Jour. de Pharm. et de Chim., Aug. 15, 1892.

Sandal Wood and Cedar Oils.—R. A. Cripps. The author, from the results of extensive labors of his own, and those obtained by other workers, suggests that the official description of the character and tests of sandalwood oil should be modified as follows: "Thick in consistence, pale yellow or nearly colorless, possessing a strongly aromatic odor, a pungent and spicy flavor, and a neutral or slightly acid reaction. Its specific gravity should not be below .970. At 60° F. (15.5° C.) it forms a clear or at most a faintly opalescent solution with five times its volume of a mixture of five fluid parts of rectified spirit with one fluid part of distilled water. It rotates the plane of polarization of a ray of polarized light strongly to the left. Two drops of the oil added to six drops of nitric acid, sp. gr. 1.5, on a white tile should give a yellow to bright reddish-brown coloration, without any green, indigo, or violet tint at the edges during five minutes. For complete saponification in alcoholic solution, it requires not more than 1 per cent. of potasssum hydrate." It is not improbable that further experience will show that these tests are not sufficiently restrictive, for although they would detect comparatively small additions of cedar-wood, copaiba, or castor oils, or turpentine, they would fail in the case of small quantities of West Australia or West Indian sandalwood oils.—Pharm. Jour. and Trans., 1892, 461.

Oil of Turpentine—Action of Acetic and Formic Acid on.—Bouchardat and Oliviero report that by the action of glacial acetic acid on lævogyre oil of turpentine in the cold and at 100°, a complex mixture is formed of lævogyre terpilen, terpilenol acetate ($C_{10}H_{16}C_2H_4O_2$), also the two isomers,

borneol acetate and isoborneol acetate. At 150–200° the formation of terpilenol acetate ceases. The presence of water, in various proportions, retards the combination, until, when 25 molecules of water are present, the action ceases entirely. In the other case a partial transformation of terebenthene into active isomeric terpilene takes place, as is proven by the increase of rotatory power.

The action of formic acid differs in being more violent, destroying the rotatory power. In the presence of 1, 3 and 5 molecules of water an abundant formation of free terpin takes place. By this action of formic acid the presence of small quantities of terpin is explained in hydrated volatile oils, which have been kept for a certain length of time, formic acid being invariably present in the volatile oils.—L'Union Phar., March, 1893, 116; Am. Jour. Phar., 1893, 230.

Rixolin.—Under the above name L. Reisberger (Rev. de chim. industr.) is marketing an artificial "oil of turpentine." It is a mixture of petroleum and camphor oil and has a sp. gr. of 0.8535. It flashes at 55° C.—Phar. Zeit., 1893, 80.

Oil of Thuja.—O. Wallach has separated this oil into three portions by fractional distillation. The second fraction, boiling between 190° and 200°, constituting the greater part of the oil, was the subject of investigation. The basic product obtained from the fraction boiling between 195°–199° had the same composition as bornylamine and fenchylamine, but is not identified with either.—Annalen der Chem., 1892, 272, 99.

Turkey Red Oil.—P. Juillard.—Abstract in Jour. Chem. Soc., 1892, 819.

Oils (Fixed) and Fats.

Fats and Oils—Revision of Constants employed in the Analysis of.—Thomson and Ballantyne (Jour. Soc. Chem. Ind., x, 233; Jour. Chem. Soc., 1892, 547). In the table of "constants in oil analysis," which accompanies the original paper, will be found collected that portion of the authors' results which they regard as useful in oil analysis.

Iodine Absorption.—In a previous communication (Ibid., 9, 587), it was shown that the variation in iodine absorption for different olive oils was greater than usually stated. Since then, it has been found to be ½ per cent. higher still, so that the iodine value ranges from that of Gloja (79 per cent.) to that of Mogadore olive oil (86.9 per cent.). The lowest figure for rape oil now stands at 99.1, and the highest at 105.6 per cent.

Potash Neutralizing Power.—The figures respecting olive and rape oils are in close accord with those obtained by Archbutt, and do not represent such a great variation between each individual oil as those given by other observers. The limits of five specimens of linseed oil examined by the authors vary from 19.00 to 19.28, whilst those of nine specimens tested by other observers and recorded by Allen, range between 18.74 and 19.52.

Unsaponifiable Matter.—Olive, refined cotton-seed, unrefined arachis, and linseed oils, contain about the same proportion of unsaponifiable matter, so that the determination of that constituent in a sample, say, of olive oil, would not serve to show any adulteration with either of the other three oils. But the presence of a considerable portion of rape oil would tend to reduce the percentage of unsaponifiable matter. In marine oils, it is noteworthy that seal oils contain only about one-third of that contained in whale, cod, and menhaden oils.

Specific Temperature Reaction.—This is merely a modification in recording the results of Maumené's reaction with strong sulphuric acid. It consists in mixing 50 Gm. of water with 10 C.c. of sulphuric acid, each at 20°, and registering the highest temperature reached. The amount of water is best measured from a pipette at 15.5°, and the sulphuric acid should be run in from a pipette which will deliver the 10 C.c. in one minute. During the addition, the mixture should be vigorously stirred with the thermometer, and the highest temperature reached rapidly read off, as it only remains constant for a few seconds. The oil being tested in precisely the same manner, it is only necessary to divide the rise in temperature obtained with water into that obtained by the oil under examination. The answer is the specific temperature reaction compared with water as 100. The oils must be carefully weighed, and the acid added to them exactly as with water, except that even more vigorous stirring is necessary during and after the addition of acid. In this way, the rise in temperature in all the experiments made by the authors was fairly steady up to the highest point, at which the temperature remained constant for 50 to 60 seconds. In the case of linseed, cod, seal, and menhaden oils, the tests had to be made with a mixture of 20 Gm. of these oils and 30 Gm. of olive oil of known specific temperature reaction. As a rule, an oil having a high iodine absorption has also a high specific temperature reaction, but the rise is not always directly as that in the former. The reason the specific temperature reaction cannot be depended on with the same assurance as the iodine value is that it shows, in some cases, large variations for the same class of oils.

Valenta's Test.—The authors conclude from the results of their experiments, that this test is surrounded with too many conditions to be of any practical value in the general analysis of oils.

Oleic Acid.—Although the percentage of free acid cannot be looked on as a constant, the authors consider that it serves a purpose in indicating to some extent the condition of the oil, and shows how little, if at all, a high free acidity affects the results of analysis.

Fat and Oil Examinations.—W. Fahrion has simplified the method of detecting the unsaturated fatty acids of fats and oils, so that it is possible to carry out the oxidation of the unsaturated fatty acids in the original soap solution.—Chem. Zeit., 1893, 610.

Fats, Testing of with Acetic Acid.—Ferd. Jean (L'Industrie laitiere, June 26) recommends the testing of fats with acetic acid for recognizing their purity and as control experiments of results obtained by other methods. Equal measures of the acetic acid (spec. grav., 1.056) and the fat, 3 C.c. of each, are introduced into a narrow graduated tube, the fat being previously heated to 50° C., and the acid measured at 22°; the tube is placed in a water-bath, agitated occasionally, and when the two liquids have completely separated, the volume of undissolved acid is noted. It has been observed that under the conditions stated the following fats dissolve different quantities of the acetic acid; namely, cocoanut oil, castor oil and mineral oil, each 100 per cent.; butter from nine districts, 63.33 (from two other districts, 58.33 and 73.0 respectively), Indian poppy oil, 63.3, beech nut oil, 53.3, French poppy oil, 43.3, neats' foot oil, 43.3, ground-nut oil, 43.6–41.65, palm oil, 4.00, nut oil, 36.6, olive oil, 35.0, mustard oil, 33.3, almond oil, 33.0, colza oil, 30.0, lard, 26.66 per cent.; rosin oil dissolves nothing.—Am. Jour. Pharm., 1892, 516.

Saponifiable and Non-saponifiable Fats—Examination of Mixtures of.—Honig and Spitz.—Zeitschr. f. angew. Chem., 1891, 565; Zeitschr. f. anal. Chem., 1892, 477.

Fats—Contributions to the Analysis of.—Lewkowitsch.—Jour. Soc. Chem. Ind., xi, 134.

Fats—Analysis of Mixtures of Saponifiable and Unsaponifiable.—Hönig and Spitz recommend the method devised by Morawsky and Dembsky.—Zeitschr. f. angew. Chem., 1891, 565; Jour. Chem. Soc., 1893, 102.

Seed Crushing and Oil Extracting.—Pharm. Era. 1893, 334.

Almond Oil—Oils of Apricot, Cherry, Plum and Peach, their possible Use in the Adulteration of.—C. Micko has made quantitative determinations of the oil in the seeds of these fruits, as well as a critical chemical examination.—Zeits. Oest. Apoth. Ver., 1893, 175.

Oleum Cacao.—Helfenberger Annalen, 1891; Phar. Centralh., 1892, 438.

Camphor Oil.—Since 1885, the importation of this oil from Japan has fallen off. As a material for artists the more volatile portion has been found very useful, as its capacity for dissolving resins is greater than that of turpentine or any other essential oil.—Ber., Schimmel and Co., April, 1893.

Castor and Olive Oils—Adulteration of.—E. J. Parry and P. A. Estcourt examined commercial specimens. Out of fourteen samples of castor oil six were genuine and eight adulterated, and of fourteen samples of olive oil three were pure and eleven adulterated. Any sample of castor

oil whose specific gravity does not fall within the limits of .956 and .966 should be viewed with grave suspicion, and if it is below .950 or above .969 is almost certainly adulterated. The saponification equivalent of pure castor oil—that is, the number of grams saponified by a litre of normal alkali—should fall between 310 and 320, and the iodine absorption, according to Hübl, falls between 84 and 84.7 : their experiments give 85. As will be seen from Table I, none of the figures contained agreed with these. With regard to the rise in temperature when mixed with an equal weight of sulphuric acid—that is, 2 volumes of oil to 1 of sulphuric acid (97 per cent.)—their figures do not agree with those recorded by other observers. Allen gives 65° C., Archbutt gives 46° C., and they have repeatedly found 72° to 74° for castor oil of undoubted purity.

Table I.

	Specific Gravity.	Saponification Equivalent	Iodine Absorption.	Temperature Rise.
1,	.9735	400	67	60° C.
2,	.9721	420	65	62° C.
3,	.9723	400	64	63° C.
4,	.9740	445	—	60° C.
5,	.9766	428	—	62° C.
6,	.9752	403	—	61° C.
7,	.9739	440	—	60° C.
8,	.9719	440	—	62° C.

The observed rise in temperature in the case of these impure samples pointed to the presence of hydrocarbons. And they found every single sample to be adulterated with rosin oil. The observation of the rise of temperature with sulphuric acid may be considered, if not the most important, one of the most valuable tests of those used to ascertain the genuineness or otherwise of the olive oil submitted for analysis.

The following table gives their results :

	Specific Gravity.	Rise of Temperature.	Iodine Absorption.	Saponification Equivalent.	Valenta.
1	.9199	60° C.	100.0	288	68° C.
2	.9182	60° C.	97.5	288	60° C.
3	.9186	60° C.	93.0	286	55° C.
4	.9194	55° C.	98.5	293	55° C.
5	.9190	57° C.	99.0	297	50° C.
6	.9187	65° C.	96.5	288	58° C.
7	.9187	64° C.	97.0	288	55° C.
8	.9188	66° C.	96.0	290	55° C.
9	.9187	64° C.	97.5	290	50° C.
10	.9188	68° C.	96.5	288	54° C.
11	.9187	67° C.	97.5	289	52° C.
Pure oil	.9170	40–43° C.	81–84.5	285–296	95° C.

The adulterant used in these eleven samples was cotton-seed oil—Am. Jour. Pharm., 1893, 231 ; from Chem. and Drug., 1893, 488.

Oil of Cade.—W. A. Beardmore. The oil which gives the best results from both a pharmaceutical and therapeutical standpoint, is characterized by a dark brown color, and is a thick empyreumatic tar-like liquid of acid reaction and having a sp. gr. of 0.976. The oil is readily soluble in absolute, ethylic and amylic alcohols, as well as in benzin, ether and carbon disulphide, and is readily miscible in all proportions with olive oil.—Pharm. Record, 1893, 59.

Cocon Oil.—Denegri and Fabris have made a detailed and extensive examination of the fatty oil contained in Bombix mori.—Abstract in Pharm. Post, 1893, 196.

Cotton Seed Oil in Lard and Olive Oil.—F. Gantter.—Zeitschr. f. Anal. Chem., 1893, 303.

Cocoanut Oil and Palm Oil—Recognition of.—E. Millian in Jour. Pharm. Chim., 1893, 524.

Digitalis—Oil of.—J. W. England.—Amer. Jour. Pharm., 1892, 361.

Fish-oils.—The examination of a number of different fish-oils demonstrates that the solid fatty acids are made up in the main of palmitic acid with small quantities of stearic acid ; the liquid fatty acids are not identical with any of the known acids: Asellic acid, $C_{17}H_{32}O_2$, and jecoric acid, $C_{18}H_{30}O_2$, isomeric with linolenic acid, to which the easy oxidation of the oils is due ; both of these acids are oxidizable by alkaline permanganate of potassium solution yielding characteristic oxy-acids ; the ultimate analysis of the oxy-jecoric acid gave results indicating the presence of a third acid, possibly isomeric with linolic acid.—Dr. W. Fahrion, Chem. Ztg., 1893, 684.

Oleum Hyoscyami Concentratum.—Helfenberger Annalen, 1891 ; Phar. Centralh., 1892, 426.

Jatropa Curcas—Oil of.—This oil differs from castor oil only relatively in the proportion of its constituents.—Arnandon and Ubaldini, in Mon. Scien. [4], vii, 447 ; Pharm. Jour. Trans., 1893, 5.

Linseed Oil—Rosin Oil in.—Coreil (Journ. de Pharm. et de Chim., Feb. 15, 1892), after reviewing the qualitative tests for rosin oil in linseed oil, proposes a quantitative test based on saponification with alcoholic potassium

hydrate solution. The qualitative tests mentioned are: (1) The red and brown colol produced by fuming bichloride of tin; (2) The non-saponification by alkalies; (3) Odor and taste by which 5–10 per cent. of rosin oil could be recognized; (4) The brown and black color produced by a current of chlorine. The quantitative test which, however, only comes near the truth is as follows: 2 Gm. of the oil are freed of air by heating to 105° C. for five or six hours, then heated on a water bath with 40 C.c. of a demi-normal alcoholic solution of potassium hydrate, the remaining alkali being titrated with a demi-normal solution of hydrochloric acid in the presence of phenolphthalein. The number of C.c. used to saturate the fatty acids of the oil is multiplied by 0.02805, and the product divided by 2 to obtain the quantity of potassium hydrate necessary to saponify 1 Gm. of oil. The quantity of potassium hydrate used to saponify 1 Gm. of linseed oil varies between 201–221 mg. (average 211), for resin oil, 21–41 mg. (average 31). The final calculation is based on the fraction

$$\frac{100\ (211-n)}{211-31}$$

n representing the quantity of potassium hydrate necessary to saponify 1 Gm. of the oil.

Olive Oil.—Of 12 samples of olive oil examined at Montpellier in 1891, 4 were found to be pure, 4 to be mixtures with other oils, and 4 to be olive oil in name only. In the same report (Rev. internat. d. Falsif., May, 1892), it is stated that the average quality of wine as well as milk has slightly improved during the same year.—Am. Jour. Pharm., 1892, 468.

——— *Cotton Seed Oil in.*—See Cotton Seed Oil.

Sesame Oil—Test for.—Baudouin's test with sugar and hydrochloric acid is best carried out by using the following proportions: 0.1–0.2 Gm. sugar are dissolved in 20 C.c. hydrochloric acid (specific gravity 1.18), 10 C.c. of the oil added and the mixture well shaken; no matter whence the source of the sesame oil, the acid layer immediately upon separation shows a permanent deep wine-red coloration. In the test it is essential that the hydrochloric acid be of the prescribed strength, as a weaker acid will not give the test. Olive, cotton-seed and arachis oils cause no red coloration, but impart to the acid after a time a dirty yellowish-brown color; mixtures of sesame and olive impart a red color, the intensity of which is proportionate to the quantity of the former oil; 10 per cent. sesame oil still causes a pure dark-rose color. Of the several commercial olive oils only the Bari-oil, as announced by Villavecchia and Fabris, by the above test simulates the behavior of sesame oil, but there are such points of difference that it is possible to distinguish between the two. Bari-oil with the test gives a red coloration equal in intensity to olive oil containing 10 per cent.

sesame oil, but this coloration never appears immediately after the separation, but always requires several minutes for its development; again, the color always shows a bluish-violet shade. Of interest is also an observation made with an old, strongly rancid sesame oil; this gave an indigo blue instead of a wine-red coloration.—G. Ambühl, Schwz. Wochenschr. f. Chem. u. Pharm., 1892, 381; Am. Jour. Pharm., 1892, 564.

Spontaneous Combustion of Oily Rags.—L. Vuaflart in Jour. Pharm. Chim., 1893, 19.

OILS (MINERAL).

Mineral Oils—The Oxidation and Saponification of.—By the joint action of sulphuric acid and atmospheric oxygen, the napthene hydrocarbons undergo a partial oxidation, since the resinous or bituminous constituents obtained are found by analysis to be oxygenated, and the practical utilization of the products substantiates this. The solid constituents (bitumen) in crude oil are undoubtedly produced in the interior of the earth by oxidation under pressure, and the products at least partially enter solution in the crude oil. It appears that the presence of natural oxidation products greatly increases the tendency of the mineral oils to oxidize when treated with sulphuric acid and oxidizing agents, therefore in practice it is best to take the fractions obtained by treating the naphtha residues with superheated steam. Taking the mixed fractions having a specific gravity of about 0.900 and heating them with sulphuric acid and manganese dioxide while air is forced through under pressure, there will result a product of which, when purified by distilling with water in vacuo, 60–80 per cent. is directly saponifiable with alkalies. The product through exposure to air loses to a considerable extent the property of saponification; increase of temperature in the saponification also brings about changes in the oils and causes them to separate from combination. A soap made by observing proper precautions was found to be as valuable as any soap made from vegetable or animal fats.—R. Haack, Chem. Ztg., 1892, 1598; Am. Jour. Pharm., 1893, 11.

Mineral Oils—The Flash-Point and Point of Danger in.—D. R. Stewart. —Chem. News, 1893, 291. Reprinted in Amer. Jour. Pharm., 1893, 362.

Rosin Oils and Mineral Oils, and Mixtures Thereof—Solubility of, in Acetone.—E. Wiederhold.—Jour. prakt. Chem., 47, 394; Jour. Chem. Soc., 1893, 350.

Fatty Oils in Mineral Oils.—Fatty oils in mineral oils may be detected if present to the extent of one per cent. by heating 15 grams of the sample with 100 C.c. of a 10 per cent. alcoholic solution of potassium hydrate for one to two hours; after cooling, an equal volume of water is added and the mixture filtered through a water-wetted filter, the filtrate neutralized with hydrochloric acid and calcium chloride added, when an insoluble cal-

cium soap will separate out if a vegetable or animal fat was present in the sample. For quantitative work the method is also suitable, providing the fat is present in not too large quantity, as the calcium soap in any quantity lumps together and prevents washing; for this purpose the first filtrate and washings are concentrated to 100 C.c., neutralized, precipitated with calcium chloride, the precipitate collected upon a weighed filter (dried at 100° C.), washed with as little water as possible to remove the chlorides, dried at 110° C. and weighed; by ignition, the weight of CaO is found, which subtracted from the weight of the precipitate, gives the weight of the fatty acid anhydrides. To calculate the weight of the fat, the glycerin anhydride corresponding to calcium oxide must first be ascertained, which is done by multiplying the weight of the CaO by 0.774; then adding this and the weight of the fatty acid anhydrides, there results the weight of the fat in the quantity taken for analysis.—J. Klimont, Chem. Ztg., 1893, 543.

Rosin in Fatty and Mineral Oils—Detection of.—A. Grittner. (Zeitschr. f. ang. Chem., 1892, 265; Jour. Chem. Soc., 1892, 548). The original process proposed by Storch has only a limited application, as, when sulphuric acid is added to the solution of the oil in acetic anhydride, train oil gives a red color, whilst with cholesterol, present in many fatty oils, a violet one is produced. With dark-colored mineral oils, the process fails altogether. Morawsky has modified the process by using a weaker acid of 1.53 sp. gr. Holde also made use of this acid (without the acetic), but of late, he has increased the strength to 1.624 sp. gr., as with the weaker acid the violet-red color takes a long time to develop. The author found that when mixing rape oil with 1 per cent. of rosin oil, the adulteration may be easily detected by Holde's original or modified process; but Morawsky's method was still more delicate, as it showed ½ per cent. Black rosin oil did not give such a characteristic reaction as was observed with oils of a lighter color. Train oils, before being tested, must be shaken with alcohol, and the alcoholic solution tested for the rosin oil. The reaction is best observed by allowing sulphuric acid to run down the side of the test tube; if rosin oil be present, a red or violet ring will form at the point of contact. With dark-colored oils, Holde's method is the best; but with light-colored train oils, Morawsky's process is preferable. As the reaction is also caused by colophony and shellac, the absence of these substances must be ascertained; and should they be present, it is necessary to saponify the oil and to test the unsaponifiable portion. For dark mineral oils, it is advisable to use an acid of 1.53 sp. gr., as the use of a stronger acid often causes a dark-yellow coloration, which renders the reaction less characteristic. Samples of rosin oil examined by the author gave the reaction with this acid just as plainly as with the 1.624 sp. gr. acid.

Schädler remarks that train oil mixed with syrupy phosphoric acid (5 to

1) gives a red color, which gradually turns very dark, and is even noticed in mixtures containing only 1 per cent. of the oil. The author never succeeded in obtaining this reaction, and only noticed a dirty brown color. The reaction depends on the nature of the rosin oil. The author occasionally succeeded in detecting an admixture of 5 per cent., but often could not find it at all. The phosphoric acid process is therefore not to be recommended.

Paraffin Oil as a Solvent.—To determine to a limited extent its solvent powers over such substances as might be used as medicaments in combination, a few experiments were made. One grain each of the following substances, in a finely-divided condition, was added to one hundred grains of the paraffin oil and repeatedly shaken during twenty-four hours, and, where allowable, with the application of heat, with the results given below:

Soluble.—Iodine, europhen, menthol, thymol, camphor, salol, phenol, benzoic acid, cocaine alkaloid, guaiacol, eucalyptol, terebene.

Slightly Soluble.—Iodoform, aristol, hydrastine (white alkaloid).

Almost Insoluble.—Iodol.

Insoluble.—Salicylic acid, boric acid, resorcin, beta-naphthol, chloral hydrate, acetanilid.—West. Drug., 1892, 380.

General.

Organic Materia Medica—The Chemistry of Modern.—In Notes on New Remedies, 1892 and 1893. The chemistry of the following are given: Analogues of the Hydrocarbons, Pyridine, Chinoline, Furan, Pyrrole, Thiophene, Halogen Derivatives, Chlorine Compounds, Bromine Compounds, Brom-Benzenes, Iodine Compounds, Alcohols, Phenols, Ethers, Aldehydes and Ketones, Acids.

Organic Chemistry in the Domain of Science—The Position of.—E. A. Schubert.—Bull. Pharm., 1893, 17.

Organic Analysis—New Method.—Berthelot.—Bull. Soc. Chim. de Paris, 1892, No. 13; Abstract, Chem. News, 1892, 185.

Organic Synthesis—Attempt at a General Method of.—R. Pictet.—Compt. rend., cxv, 708; Chem. News, 1892, 262 and 273, etc.

Ultimate Analysis of Organic Substances—A Source of Error in.—G. Neumann.—Monats. f. Chem., 13, 40; Zeitschr. f. Anal. Chem., 1893, 98.

Carbon in Organic Substances in the Moist Way—Determination of.—Archiv. f. Hygiene, 14, 364; Zeitschr. f. Anal. Chem., 1893, 96.

Oxidation and Sulphonation of Organic Substances by Ammonium Bisulphate—Process of.—Lachaud and Lepierre prepare an entire series of colors.—Bull. Soc. Chim. de Paris; Chem. News, 1892, 270.

Organic Compounds—Oxidation, by Potassium Permanganate.—Benedikt and Neundörfer in Chem. Zeit., 16, 77; C. Micko, in Zeits. Oëst. Apoth. Ver., 30, 197.

Benzenic Series—Cryoscopic Studies in the.—J. Hausser.—Bull. Soc. Chim. de Paris, Series III., No. 14.

Detection of the Radicle Benzoyl in Organic Compounds.—E. Leger finds the odorous product produced in toxicological analyses of cocaine by F. da Silva to be ethylbenzoate. This reaction is produced by other substances containing the radicle benzoyl.—Bull. Soc. Chim. de Paris; Chem. News, 1893, 25.

Fatty Series—Synthesis in the, by means of Zinc Chloride.—I. Kondakopf.—Abstract, Jour. Chem. Soc., 1893, 382.

Isomerism in the C_6 Series—Some Cases of.—Griner.—Abstract, Jour. Chem. Soc., 1893, 237. The author has studied the tetrabromides and dihydriodides of diallyl and has prepared a number of new unsaturated fatty hydrocarbons and their derivatives.

Naphthalenes and their Derivatives in the General System of Organic Compounds.—W. Markownikoff.—Jour. f. prakt. Chem., xlv, No. 12. A voluminous memoir.

CARBON COMPOUNDS.

Acetone.

Acetone.—Its sp. gr. and solvent power upon certain inorganic salts and its solubility in aqueous solutions of sugar. Krug and McElroy.—Jour. Anal. and App. Chem., 6, 184 and 188.

——— *Specific Gravity of Aqueous Solutions of.*—McElroy and Krug.—Jour. Anal. Chem., 6, 187.

——— *Derivatives.*—See Jour. Chem. Soc., 1892, 1425. (Abstracts.)

——— *with Benzoin—Condensation of, by means of Potassium Cyanide.*—A. Smith.—Ber. d. Chem. Ges., xxvi, 65.

——— *Chlorination of.*—P. Fritsch.—Ber. d. Chem. Ges., xxvi, 597.

——— *Action of Nitric Acid on.*—Behrend and Schmitz.—Ibid., 626.

Acetone with Sulphuric Acid—The Products of the Condensation of.—W. R. Orndorff and S. W. Young.—Am. Chem. Jour., 1893, 249.

Acetone—Volumetric Estimation.—The usual method for the determination of acetone rests upon the conversion of that body into iodoform, which is weighed. The method is slow and inexact, owing to the loss of iodoform by volatilization. These inconveniences are remedied by F. Robineau and G. Rollin (Monit. Scient., vii, 272, through The Analyst), who convert the method into one in which the estimation is volumetric. The acetone, having been obtained in a solution free from substances that also give the iodoform reaction, is treated with excess of potassium iodide and caustic soda, and a standard solution of sodium hypochlorite run in until the conversion of the acetone into iodoform is complete, as evidenced by the appearance of a blue coloration when a drop of liquid, being

titrated, is placed upon a piece of paper, moistened with a solution of starch and sodium bicarbonate. A mere trace of sodium hypoiodite, in the presence of caustic soda, gives a blue color with starch paper that is saturated with sodium bicarbonate. Certain precautions are necessary to obtain exact results. The liquid containing the acetone must be made thoroughly alkaline with caustic soda, as otherwise more hypochlorite than the normal amount will be necessary to convert the acetone into iodoform. An excess of potassium iodide must be present. The dilution of the solution titrated must be nearly the same in all cases, and a similar strength of hypochlorite must always be used. The operation should not be conducted in a strong light, and the solution must be constantly stirred during titration. The standardization of the hypochlorite is effected by means of pure acetone.—Am. Drug., 1892, 385.

Aldehydes.

Citronellic Aldehyde.—E. Kremers.—Amer. Chem. Jour., xiv, 203.

Crotonaldehyde—Preparation of.—J. A. Müller.—Abstract, Jour. Chem. Soc., 1892, 809.

Aldol and Crotonaldehyde—Preparation of.—Orndorff and Newbury.—Abstract, Jour. Chem. Soc., 1892, 1423.

Crotonaldehyde—Preparation of.—A. Lieben.—Ibid., 1424.

Amidoacetylaldehyd.—E. Fischer, in Ber. d. Chem. Ges., xxvi, 92; Pharm. Centralh., 1893, 278.

Formic Aldehyde.—Berlioz and Trillat arrive at the conclusion that the vapor of formic aldehyde is rapidly diffused through animal tissues, rendering them insusceptible of putrefaction. Even in very small proportion the vapor prevents the development of bacteria. Within a few minutes it sterilizes substances impregnated with the bacilli of Eberth or those of anthrax. The vapor is not poisonous even when inhaled for several hours and in large quantity.—Compt. Rend., cxv., 290; Phar. Jour. and Trans., 1892, 181.

——— *As an Antiseptic.*—By A. Trillat. The author has proved by experiments that the antiseptic power of formic aldehyde is superior to that of bichloride of mercury. The action of the aldehyde in preventing fermentation is not less remarkable, though the results obtained on subjecting animals to subcutaneous and intravenal injections were not such as would justify the indiscriminate use of the formic aldehyde as a general antiseptic.—Compt. rend., cxiv, 1278.

——— *Action of, on Coloring Matters.*—Trillat observed (Bull. de l'Assoc. des Chim. de sucrerie et dist., July, 1892) that this compound (formol) removes the natural red color of wine, a compound with tannin being formed, while the decoloration of wines artificially colored is usually incomplete; rosaniline, for instance, assumes by this treatment a charac-

teristic violet blue color. Formol may therefore be employed for recognizing the presence of foreign coloring matters in wine; and it is also of service in the estimation of sugar in natural wine, since the decoloration produced does away with the treatment with animal charcoal.—Am. Jour. Pharm., 1893, 15.

Formaldehyde.—A. Ketsule.—Ber. d. Chem. Ges., 1892, xxv, 2435.

Methylfurfuraldehyde and Methylpyromucic Acid.—Hill and Jennings.—Amer. Chem. Jour., xv, 159.

Aldehyde and Ketone with Aromatic Nitro-Compounds—Reaction of.—Béla von Bitto.—Ann. der Chem., 269, 377.

Alcohols.

Alcohol—Indirect Estimation in Solutions containing Water, Alcohol and Extractive Matter.—Zeitschr. f. Anal. Chem., 1892, 335.

Monatomic Alcohols—Test for.—B. v. Bitto in Chem. Zeit., 1893, 611. 1–2 C.c. of an aqueous methyl-violet solution (0.5 in 1000.0) are added with 0.5–1 C.c. of an alkaline polysulphide solution to 2–3 C.c. of the liquid to be tested for monatomic alcohols; in the presence of the latter, the solution becomes cherry or violet-red in color without becoming turbid, and after prolonged standing the colorations may change. In the absence of this class of alcohols the solution becomes greenish blue, separating after some time reddish-violet flakes, the liquid itself changing yellow. Methyl, ethyl, normal and iso-propyl alcohols give a cherry-red color, while tertiary and iso-butyl alcohols, iso-butyl-carbinol and allyl alcohol give a violet-red color. The test is not suitable for the detection of traces of these alcohols, but is serviceable as a class reaction. The test is not given by polyatomic alcohols, carbohydrates, acids, phenols, aromatic compounds, etc.

Indicator for Alcoholic Solutions—New and Delicate.—S. Ruhemann, (Jour. Chem. Soc.), suggests the use of the imide of dicinnamylphenylazimide as a delicate indicator with alcoholic solutions; the change is from red (acid) to purple (alkaline), and the color is intensified by heating; it can be used to determine the small amount of alkali dissolved from glass by alcohol. The blue (purple) alkali salts are decomposed gradually by water, the ammonium salt being especially unstable. The indicator is best prepared by adding the calculated quantity of bromine (2 molecules) to ethyl cinnamate dissolved in chloroform; the solvent is evaporated, and the resulting mass quickly heated with twice its weight of phenylhydrazine; after the violent evolution of gas has ceased, the semi solid product is shaken with dilute hydrochloric acid, and filtered; through the filtrate is passed a current of air, warming at the same time. A red precipitate of the imide is formed, which is washed with water and crystallized from hot glacial acetic acid. A mere trace of the indicator is re-

quired, as its solubility in alcohol is very slight; the alkaline salts are readily soluble in this menstruum.—Nat. Drug., 1892, 42.

Alcohol in Various Preparations—Determination of.—Tscheppe (Rev. intern. des Falsif., etc.), proposes a method of determining the presence of alcohol in malt extracts, cod-liver oil, preparations of albumens, pepsin, varnishes, etc., substances in which other methods of research are not applicable, as follows: The substance under examination is agitated in a test tube along with nitric acid at 70° (acid nitric, 70 parts; water, 30 parts). If free alcohol is present there will appear at the zone of separation of the liquids a line of beautiful emerald-green coloration, and, little by little, there is a disengagement of gas having the odor of nitrous ether.—Nat. Drug., 1893, 186.

Alcohol—New Method of Determination in Alcoholic Liquids and Beverages.—Gossart, in Jour. Pharm. Chim., 1893, 307.

Mixtures of Water and Alcohol—Distillation of.—Sorel in, Compt. rend., cxvi, 693; Jour. Chem. Soc., 1893, 347.

Higher Alcohols—Detection of, in Spirits of Wine.—C. Bardy. A preliminary examination is made by agitating 10 C.c. of the alcohol with 100 C.c. of a saturated salt solution. If an oily upper layer does not separate, 100 C.c. of the alcohol is agitated with 450 C.c. of a saturated salt solution in a vessel provided with a stop-cock; sufficient water is added to redissolve the salt that is precipitated, and then 60 to 70 C.c. of carbon bisulphide, and the mixture is well agitated. After a short time, the bisulphide is transferred to a smaller similar vessel, and the extraction is repeated a second and third time with similar quantities of carbon bisulphide, the whole of the latter being transferred to the second vessel. In order to separate the alcohols from the bisulphide, the latter is mixed with sufficient concentrated sulphuric acid (about 2 C.c.) to form a heavier layer at the bottom of the vessel, and, after vigorous agitation, the acid is transferred to a smaller vessel. The extraction is repeated several times with 1 C.c. of acid each time, and the various quantities of acid are mixed, heated at 50–60°, and a current of air passed over the surface of the liquid until all the bisulphide is expelled. An equal volume of glacial acetic acid is then added, and the mixture heated on a water-bath at about 100° for a quarter of an hour, the flask being fitted with a reflux condenser. When the action is complete, the contents of the flask are poured into 100 C.c. of saturated salt solution. If higher alcohols were originally present, the corresponding acetates separate and form an upper layer, the volume of which can be measured by any of the usual methods, the liquid being previously cooled to 15°. The number of cubic centimetres of acetates multiplied by 0.8 gives the percentage of higher alcohols in the alcohol examined.

If in the preliminary test an oily upper layer separates, only 25 C.c. of

the alcohol should be taken and mixed with 100 C.c. of saturated salt solution and 8 to 10 C.c. of water. The quantity of carbon bisulphide, however, ought not to be reduced, and all the other operations are conducted in the manner described.

The carbon bisulphide dissolves only butyl and amyl alcohols, and if propyl alcohol is sought for, the salt solution that has been extracted with bisulphide is filtered and distilled until an alcoholometer in the receiver marks 50°. The quantity of propyl alcohol in the distillate is estimated by titration with permanganate (Barbet) or by Gossart's method.

Alcohol in the distillery residues known as "essential oils" may be determined by a modification of this method. 500 C.c. is agitated with an equal volume of salt solution, and the latter is extracted with three successive quantities of carbon bisulphide and afterwards distilled. The alcoholic strength of the distillate, corrected, if necessary, for the presence of propyl alcohol and calculated to the original volume, gives the percentage of alcohol present.

This method will detect 0.5 per cent. of higher alcohols in spirits of wine. Greater sensitiveness can be obtained by working with a larger quantity of the alcohol, but in this case a correction must be made on account of the ethyl acetate formed from the alcohol dissolved by the carbon bisulphide.—Compt. rend., 114, 1201; Jour. Chem. Soc., 1892, 1379.

Higher Alcohols and other Impurities in Vinic Alcohol—Detection of.—E. Gossart.—Compt. rend., April 17, 1893.

Alcohol—Use of Fluorides in the Manufacture of.—Jour. Amer. Chem. Soc., xiv, No. 7, Leo Baekland.

Series of Alcohols—Odors of the.—J. Passy.—Compt. rend., 1892, 447.

Commercial Spirits—Process for Examining.—E. Mohler determines acids, ether, aldehyds, furfurol, homologous alcohols and nitrogenous compounds.—Chem. News, 1892, 328. Original, see Ann. Chim. et Phys, 1892.

Alcohol in Imported Spirits—Rules for the Estimation of.—With tables giving the sp. gr. of alcohol from .984 to .936 computed to the third place of decimals. C. J. H. Warden. Calcutta: Printed at the Bengal Secretariat Press.

Alcohol from Cellulose.—Pharm. Jour. Trans., 1893, 5.

Fermented Liquors—Methods of Analysis of.—From Official Methods of Analysis of the Assoc. of Official Agri. Chem. for 1890–91.—Chem. News, 1892, 112.

Fatty Alcohols—Action of Zinc Chloride on.—I. Kondakopf.—Abstract, Jour. Chem. Soc., 1893, 382.

The Discovery of Alcohol and Distillation.—M. Berthelot.—Revue des

Deux Mondes; National Drug., Jan., 1893; Phar. Jour. Trans., 1893, 629; Bull. Pharm., 1893, 250.

Alcohol—Tax upon.—Pharm. Rund., 1893, 55.

Increasing the Tax on Distilled Spirits.—West. Drug., 1893, 75.

Free Alcohol for Manufacturing Purposes.—Editorial, Pharm. Era, 1893, 97.

Rectified Spirits for Medicinal Purposes—Manufacture of.—W. Wilson. China M. Miss. J., Shanghai, 1892, 233.

Free Alcohol for Medicine and the Arts.—Editorial, Amer. Drug., 1893, 144.

Alcohol—The Price of.—Editorial in Pharm. Review, 1893, 31.

Statistics on the Price of Alcohol and Potassium Iodide from 1858 to 1892 inclusive.—P. C. P. Alumni Rep., 1893, 122.

Alcohol War—The.—Oil, Paint and Drug. Rep.; Drug. Circ., 1892, 189.

Alcohol in the U. S.—N. Y. Corres. in Chem. and Drug., 1893, 290.

Alcohol and Cream of Tartar—Production of, from Wine Lees.—Illustrated article.—Amer. Drug., 1893, 325.

Amyl Nitrite—Danger in Handling.—Attention is called to the possible explosion of amyl nitrite kept in sealed bottles, even at ordinary temperatures. An assistant in opening a sealed tube of amyl nitrite produced an explosion, entirely destroying the tube, he receiving some injury from the fragments of glass as well as discomfort from inhalation of the drug. A second trial under the same conditions, except that a towel had been wrapped around the tube, resulted in a second explosion.—Pacific Drug.

Methyl and Ethyl Alcohol as Solvents.—Lobry de Bruyn confirms in the first instance the rule given by Dumas and Peligot that methyl alcohol occupies a position as a solvent between that of water and ethyl alcohol. Exceptions to this rule are offered by hydrogen chloride, mercuric chloride and iodide, the aromatic nitro-compounds, nitro-glycerol and collodion cotton, which are more soluble in methyl alcohol than in water or ethyl alcohol.—Jour. Chem. Soc., 1893, 244; from Ber. d. Chem. Ges., xxvi, 268.

Methyl Alcohol—Impurities in Crude.—Detection by Barillot, in Compt. rend., cxv, 1315.

Fusel Oil—The Alcohols of.—By Robt. C. Schüpphaus. A review of the bibliography and chemistry of the alcohols of fusel oil. The analytical chemist may regard fusel oil for all practical purposes as a mixture of water and ethyl, propyl, butyl and amyl alcohols.—Phar. Jour. and Trans., 1892, 33–38. Also, Jour. Amer. Chem. Soc., xiv, 45.

Amines.

Amines—Certain Molecular Compounds of.—W. Rednew. — Jour. f. prakt. Chem., xlvi, Part 5 ; Chem. News, 1893, 142.

Methylamines.—The methylamines have been examined chemically and physiologically by Dr. Combemale (Bull. gèn. de thérap., March, 1893, 241). Monomethylamine is a compound in which one hydrogen atom of the ammoniacal radical is replaced by one methyl radical, its formula being $(CH_3)NH_2$. It is a gas, which several degrees below zero is converted into a very mobile liquid ; it has an ammoniacal odor, is strongly alkaline, ignites, when it comes in contact with a flame, and burns with a yellowish color, giving water, carbonic acid and nitrogen. It is the most soluble of all known gases, one volume of water dissolving 1,150 volumes at 12°. After citing a large number of physiological experiments in detail, the author arrives at the conclusion that when injected under the skin, monomethylamine produces local irritation, even to necrosis, while its action on the entire organism causes hæmorrhage of the liver, lungs, heart and intestines. This general action is manifested by change in temperature, continuous flow of saliva, and albuminuria. The local effects are produced by a solution of 1 in 250. For the general effects the dose must not exceed 10 cgm. per kgm. of body weight ; above 15 cgm. death is certain.

Dimethylamine, $(CH_3)_2NH$, has much the same properties as monomethylamine. It is obtained pure and without difficulty by boiling nitrosodimethylamine with sodium oxide. Ingested into the stomach and employed in various doses, dimethylamine showed no appreciable action. Injected hypodermically it acts as an energetic caustic, producing an eschar with a solution of 1 in 200. Twenty cgm. per kgm. of body weight is the minimum toxic dose. The change of temperature produced is not constant, nor is it proportionate to the dose or the strength of the solution employed. It produces increased salivation and also increases the alkalinity of the saliva. It is eliminated in part by the kidneys.—Am. Jour. Pharm., 1893, 281.

Orthodiamines.—O. Fischer.—Ber. d. Chem. Ges., xxv, 2826.

Orthodiamine Derivatives.—O. Fischer.—Ber. d. Chem. Ges., xxvi, 187. Chlorine Derivatives of the Propylamines, Benzylamines, Aniline and Paratoluidine.—A. Berg.—Compt. rend., Feb. 13, 1893.

Thiosinamins.—Therapeutics.—H. Hebra.—Monatsh. f. prakt. Dermat., 1892, 337, 432. Also Internat. Klin. Rundschau, 1892, 1583.

Aniline.

Aniline and Nitro-benzene—Direct Conversion.—Bamberger and Meimberg.—Ber. d. Chem. Ges., xxvi, 496.

——— Prud'homme.—Bull. Soc. Chim., vii, 621 ; Jour. Chem. Soc., 1893, 323 ; Chem. News, 1892, 258.

Anisolines—A New Class of Coloring Matters and their Constitution.—Anisolines color unmordanted fibre (especially cotton) a magnificent reddish-violet of great fastness.—Bull. Soc. Chim., vii, 523; Jour. Chem. Soc., 1893, 274.

Asbolin.—Behal and Desvignes.—It is noteworthy that the two phenols found in asbolin are the lower homologues of the two phenols occurring in creosote.—Compt. rend., cxiv, 1541; Bull. Soc. Chim. de Paris, ix and x, No. 5.

Azo-Compounds—Reduction Products of.—Results of six investigators in Ber. d. Chem. Ges., xxvi, 681–705.

Diazoamidobenzene and Paradiazoamidotoluene Benzoates and Metanitrobenzoates.—Haller and Guyot.—Compt. rend., cxvi, 353.

Benzidin Sulphate—Preparation of.—Teichmann in Zeits. f. angew. Chem., 1893, 67.

Carbazole.—Mazzara and Leonardi.—Gazz., xxii, 569; Jour. Chem. Soc., 1893, 349.

Carboxyl Group—Influence of, on the Poisonous Action of the Aromatic Compounds.—W. Nencki and H. Bautmy. The researches of the authors are intended to show, on the basis of earlier as well as recent facts, that the introduction of the carboxyl group, CO_2H, into the molecule of a great number of aromatic compounds, involves a great decrease of their toxic action.—Archiv. de Science Biologique de St. Petersburg; Chem. Zeit., Chem. News, Sept., 1892; Am. Jour. Pharm., 1893, 36.

Carbohydrates.

Carbohydrates.—F. Ullik groups the carbohydrates exclusive of the sugars as follows: I, the amylums; II, cellulose; III, soluble starch; IV, dextrins; V, gums; VI, dextrin acids; VII, gum acids; VIII, pectins; IX. pectin acids.—Abstract, Jour. Chem. Soc., 1892, 1066.

——— *The Use of the Term.*—W. E. Stone.—Science, 1893, 149.

Dextrin, Starch, Sugar.—See under respective titles.

Catechol—Azo-Derivatives of.—Witt and Mayer.—Ber. d. Chem. Ges., xxvi, 1072.

Chloral.

Chloral Camphor.—Rucker (Zeits. Oest. Apoth.-Ver., 1892, 202) says chloral camphor can be easily prepared as a perfectly clear solution by crushing the camphor to the size of a pea, placing in a tall cylindrical glass, and adding on top of the camphor an equal quantity of chloral hydrate. Allow to stand for from 12 to 24 hours without agitation, when a perfect solution will have resulted.

Glycerinum Chloralo-camphoratum.—3 parts of camphor with 5 parts

of chloral are rubbed to a fluid mass, then mixed with 25 parts of glycerin, and the whole heated upon a water-bath to 50–60°.—Ibid., 1893, 160.

Chloral—Derivatives of.—Béhal and Choay.—Ann. Chim. Phys., xxvii, 319; Jour. Chem. Soc., 1893, 301.

Chloral and Butylchloral with Acetone and Acetophenone—Condensation of.—Koenigs and Wagstaffe.—Ber. d. Chem. Ges., xxvi, 554.

Chloral and its Derivatives.—Roussel.—Coulommiers, 1892, pp. 110.

Chloral with Ketones—Condensation of.—Wislicenus, Kircheisen, and Sattler.—Ber. d. Chem. Ges., xxvi, 908.

Chloral Hydrate with the Naphthols—Products of Condensation of.—A. Russanoff.—J. Russk. fiz-Chim. Obsh. St. Peters., 1891, 217.

Chloroform.

Chloroform.—According to Traub, chloroform prepared with chloride of lime contains ethylidenechloride, and the action of sulphuric acid shows that other impurities also occur in crude chloroform, giving rise to blue or violet coloration of the acid, and sometimes an odor of peppermint. By treatment with sulphuric acid these impurities can be completely removed, and a product obtained that is in no respect inferior to the best kinds of chloroform. Traub applies two tests for testing the purity of chloroform: (1) the sulphuric acid test; (2) based upon the action of metallic sodium. —Pharm. Centralh., 1892, 245.

——— *Preparation of Pure.*—R. Anschütz, in Ber. d. Chem. Ges., xxv, 3512; Pharm. Centralh., 1892, 753. A peculiar method is proposed by R. Anschütz, depending upon the separation of salicylid-chloroform from impure chloroform. Salicylid $C_6H_4<\overset{CO}{O}>$ and also *o*-homosalicylid, $CH_3C_6H_3<\overset{CO}{O}>$ remaining in contact with chloroform for 24 hours, form crystallizable almost insoluble compounds with chloroform, the latter being only loosely combined (comparable with the water of crystallization), and volatilized by very moderate heating. The compounds contain 33.24 per cent. and 30.8 per cent. chloroform, respectively, and can be kept for long periods in closed vessels. By heat the chloroform can be distilled shortly before it is to be used, enabling a guarantee for perfect purity. The salicylid and *o*-homosalicylid can be used over and over in this process. None of the impurities of chloroform have been found to form crystallizable compounds with salicylid or *o*-homosalicylid.

——— *Electrolytic Preparation of.*—Acetone and common salt may be converted into chloroform by electrolysis. According to the Revue de Chemie Industrielle, the apparatus consists of a retort of enameled iron, fitted with a double bottom to admit of heating by steam, and with a serpentine to condense the vapors of water and chloroform which pass off. The electrodes are of lead. Three hundred liters of a 20-per-cent. solution of common salt are introduced into the retort and heated to boiling by the

steam. The current is started, and the acetone is run in through a tube in a continuous stream. When 60 kilograms have run in, which should take about two hours, the operation is stopped. The liquid in the condenser separates into two layers, the lower being pure chloroform, and the upper water mixed with a little acetone, which is saved to dissolve the salt for the next operation. Thus prepared, chloroform does not contain any of the chlorinated bodies which so often contaminate that prepared by the old process. The yield is exactly 190 per cent. of the weight of the acetone. The lead electrodes have recently been replaced by a positive electrode consisting of a vertical shaft, upon which carbon rods are inserted, and the whole made to revolve and act as a stirrer. The negative electrode consists of a copper cylinder.—West. Drug., 1893, 149. See also Revue Scien., Feb., 1893; Jour. Pharm. Chem., 1893, 276.

Chloroform—Decomposition of, by light.—E. Biltz, in Pharm. Rund., 1893, 9–13.

——— D. Brown discussed tests for the purity of chloroform, and gives exhaustive tables to show the relative value of samples of Scotch, English and German origin. His results show that it is possible to select chloroform of a very high degree of purity, whilst, at the same time, it would appear that the commercial article is by no means uniform in quality.—(Brit. Pharm. Conference.) Pharm. Jour. and Trans., 1892, 229–232.

——— D. Brown (Ibid., 505). At present there are chloroforms prepared from at least five different sources. We require, however, but two brands, one of the highest degree of purity for anæsthetic purposes and a second for manufacturers' use. So long as it remains impossible to determine the source from which pure chloroform has been obtained, and chloroform prepared from the purest materials is found to contain more impurity than others from impure sources, the advocates of the pure raw material product as the only pure one cannot reasonably expect confidence to be placed in their statement, when pure products are known to be obtained from either source; and their position is still further weakened by the fact that they are unable to tell one pure chloroform from another without consulting the label, and even then they may be wrong, if the samples have not been correctly marked.

Purification is the only factor which determines the quality of all chloroform, and it has been successfully used to level up to a state of equal purity crude products of all kinds.

The purest chloroform therefore must be that which—irrespective of origin—contains the smallest quantity of impurity.

Chloroform—Tests for Impurities in.—By Ramsay (Chem. Ztg., 1892, 1230). By a simple method the author ascertains the presence of carbonyl chloride in chloroform. He adds baryta water to the suspected sample, and if impure, finds that a white scum is formed at the point of

contact of the two liquids.—Pharm. Centralh., 1893, 80. (See U. S. P., 1890; also Chem. and Drug., 1892, 241.)

Decomposing Chloroform — Observations on.—David Brown. The author's experiments seem to justify the rejection of Ramsay's baryta water test and the substitution of the one of zinc iodide and starch for the first indications of decomposition in chloroform. He finds, after carefully watching the decomposition in sunlight from the first indications of it until it has reached a point where no reaction is obtained with zinc iodide and starch, that this reagent deserves the first place as an indicator, the nose the second, and that baryta water may be dispensed with altogether. The chlorine reaction had almost disappeared from the chloroform employed in his previous experiments, which explains how he, at the last meeting of the Brit. Pharm. Conference, was led to place baryta water as a test for decomposition in such a false position. It was invariably observed that no reliable reaction with baryta water was obtained until decomposition was unmistakably recognized, both by zinc iodide and starch and by the sense of smell, and, further, that the carbonyl chloride reaction was obtained from samples in the most advanced stages of decomposition.

Soon after zinc iodide and starch begins to indicate, decomposition may easily be recognized by the peculiar odor of carbonyl chloride, which indication renders the application of baryta water, or any other reagent, quite unnecessary for the purpose of establishing the presence of decomposition.

During its first stages a distinct reaction is obtained with zinc iodide and starch, but none with baryta water, a separation of water being also observed. After further decomposition zinc iodide and starch gives a more marked reaction than at first, and baryta water also reacts, but faintly. Still following the decomposition, it is found that both reagents continue to give marked reaction until a point is reached, when that produced by zinc iodide and starch is observed to become less marked, and finally to disappear altogether, while the reaction with baryta water may still be obtained. A small quantity of deep straw-colored liquid is also observed at this stage floating on the surface of the chloroform.

At this point there remains a considerable quantity of undecomposed chloroform, which may, either before or after separating the decomposition products, again be put into an active state of decomposition by simply removing the stopper from the bottle for a few seconds, replacing it, and again exposing it to sunlight, when reactions similar to those already described with zinc iodide and starch are obtained. This result has been reproduced several times with about a dozen different samples of chloroform.

The following equations supply a probable explanation of the changes observed, although they do not explain all the results obtained:

$$4CHCl_3 + 3O_2 = 4COCl_2 + 2H_2O + 2Cl_2$$
$$2COCl_2 + 2H_2O = 2CO_2 + 4HCl$$
$$2CHCl_3 + 2Cl_2 = 2CCl_4 + 2HCl$$
$$6CHCl_3 + 3O_2 = 2COCl_2 + 2CCl_4 + 2CO_2 + 6HCl$$

In the early stages we find 1 $COCl_2$ to 1.29 HCl.

In the later stages we find 1 $COCl_2$ to 4.69 HCl.

The ratio as represented by the equations in similar stages is 1 to 1 + 1 to 3, the difference being no doubt due to loss of carbonyl chloride.

The straw-colored liquid found in the advanced stages contains no free chlorine; it consists of a strong aqueous solution of hydrochloric acid in which very faint traces of carbonyl chloride are found, and contains 35.45 per cent. of HCl.

The presence of this liquid in the advanced stages presents difficulties which cannot at present be satisfactorily explained; it seems highly probable, however, that the hydrochloric acid produced is dissolved in some of the water, which would otherwise have been used in decomposing carbonyl chloride.

The results of the author's experiments with chloroform in vacuo and exposed to the sunshine, indicate the absence of any oxygenated impurity in the chloroform capable of supplying oxygen for its decomposition, and to the greater stability of chloroform when kept in vacuo.

When a stream of dry oxygen is passed through the chloroform before exposure, decomposition takes place after four hours' sunshine. This is interesting in connection with Mr. T. G. H. Nicholson's proposal to introduce an "oxy-chloroform" for the purpose of increasing blood pressure and regulating respiration during its administration, and it suggests the propriety of keeping the two substances apart until they are actually required.

When the sp. gr. is reduced to 1.498 no decomposition had taken place after exposure in white glass stoppered bottles for 144 days, equal to 141 hours' sunshine, which confirms the character for stability which chloroform of a reduced sp. gr. has maintained for upwards of thirty years.—Am. Jour. Pharm., 1893, 241; from Pharm. Jour. Trans., 1893, 792.

——— C. Schacht and E. Biltz agree in the main facts with Mr. Brown. They point out the following facts:

Chloroform cannot be absolutely deprived of alcohol in any other way than by repeatedly shaking it with double its volume of fresh water. This operation should be repeated at least ten times.

To ascertain the entire absence of alcohol it is necessary to have recourse to the well-known iodoform test, or to test the chloroform with a solution of potassium bichromate exactly in the manner they have described, any stronger solution being unsuitable for the purpose.

Chloroform quite free from alcohol has the specific gravity 1.502 at 15° C. (59° F.), and its boiling point is 62.05° C. (143.7° F.) at 760 mm.

Such chloroform, when exposed to daylight of sufficient power, will begin to decompose within one or two hours. But it must be remembered that the chemical intensity of daylight varies considerably at different times. In summer it is, on an average, ten times as powerful as in winter, and even in summer time days of feeble intensity occur. Consequently the effects produced will vary, and chloroform which in one experiment is found to show decomposition within two hours, may at another time require to be exposed for a whole day to full sunlight before it shows the first signs of decomposition. The disappointment arising from frequent failure to arrive at definite results from such experiments may be attributed either to the underrating of these differences in the chemical activity of sunlight or to the circumstance that the influence of even the most minute proportion of alcohol is disregarded. If the investigators of the Pictet chloroform had paid attention to the presence of minute traces of alcohol, or had they been aware of the importance to be attached to them and the means for their detection, they would have avoided the disproof of their statement as to the exceptional durability of the Pictet chloroform. From the first announcement that this chloroform had been experimentally proved to possess a capability of resisting the influence of sunlight for four days, we drew the conclusion that it contained alcohol, and our prediction that such was the case, without even having seen a sample, ultimately proved to be correct.

Mr. Brown's statements as to the nature of the products of the decomposition of chloroform are quite correct. These products may be easily recognized, the chloride by means of zinc iodide and starch, the carbon oxychloride by its peculiar nauseous smell, distinctly different from that of chlorine. If it be needed, there is a much better mode of testing for carbon oxychloride than by the baryta water test recommended by Professor Ramsay, viz.: shaking the decomposed chloroform with mercury, which immediately combines with the free chlorine, but does not act upon the carbon oxychloride, and thus the peculiar smell of this body becomes more easily recognizable. The presence of free chlorine is sufficiently indicated by the coloration of moistened test paper charged with zinc iodide and starch when it is immersed in the atmosphere of the bottle, also by the bleaching of moistened litmus paper. After the removal of free chlorine by agitation with mercury, litmus paper is no longer bleached, but is then reddened, since the water in the paper determines decomposition of carbon oxychloride, with production of hydrochloric acid and carbonic anhydride. Before the removal of the free chlorine this reddening of moistened litmus paper is masked by the bleaching action of the free chlorine.

We have not hitherto observed the formation of a straw-colored supernatant liquid in the decomposition of chloroform, as described by Mr. Brown in his paper.

The amount of alcohol present in any sample of chloroform may be inferred with accuracy from the specific gravity of the sample in question, but as alcohol does not reduce the gravity in exact arithmetical ratio to its amount, we have found it necessary to determine the specific gravity of known mixtures of absolute alcohol and chloroform. In that way we have obtained the following data:

	Specific gravity at 15° C. = 59° F.
Pure chloroform	1.5020
" " with 0.25 p. c. alcohol	1.4977
" " " 0.5 " "	1.4939
" " " 1.0 " "	1.4855
" " " 2.0 " "	1.4705

According to these data the chloroform of 1.5 sp. gr. operated upon by Mr. Brown (see ante) would have contained $\frac{1}{300}$ of absolute alcohol (provided its specific gravity was determined at 59° F.), an amount which is in close correspondence with the observed retardation of its decomposition under the influence of oxygen and sunlight.—Pharm. Jour. Trans., 1893, 1005; Amer. Jour. Pharm., 1893, 354.

Chloroform—Decomposition of, in Presence of Iodine.—A. Besson, in Jour. Pharm. Chim., 1893, 384; Compt. rend., cxvi, 102.

——— *A Contribution to the Chemical Study of.*—L. Demont considers the action of the sulphides of potassium and sodium.—Pamph., pp. 64, Thesis, Paris.

Chloroform, Bromoform and Iodoform.—J. Passy has examined these three substances with reference to the comparative strength of odor, and finds a marked example of dualism, as he has observed in other organic compounds.—Jour. Pharm. Chim., 516; Pharm. Post, 1893, 271.

Chloroform.—Pharm. Era, 1892, 264.

Coal Tar.—See Destructive Distillation.

Coumarin—New Derivatives of.—Fittig and Claus have attempted, but unsuccessfully, to prepare orthohydroxyphenylpropiolic acid in order to compare its properties with those of coumarilic acid (Ann. der Chem., 216, 162), with which it is isomeric.—Ann. der Chem., 269, 1–14.

Creosote.

Official Creosotes—Analysis of.—Béhal and Choay in Rép. de Pharm., 1893, 97.

Official Creosotes and Guaiacols—Analysis of.—Béhal and Choay.—Compt. rend., Jan., 1893, and Bull. Soc. Chim. de Paris, ix and x, No. 5.

Guaiacol.—See Guaiacol.

Desaurin.—W. Wachter.—Ber. d. Chem. Ges., xxv, 1727.

Destructive Distillation.

Destructive Distillation.—A Manualette of the Paraffin, Coal Tar, Rosin Oil, Petroleum and Kindred Industries.—E. J. Mills. London: Gurney and Jackson.

Products of the Dry Distillation of Wood: Methylfurfurol and Methylpyromucic Acid.—H. B. Hill and W. L. Jennings.—Am. Chem. Jour., 1893, 159.

Coal Tar Coloring Matters—Qualitative Analysis of.—A. G. Green. Being a resume of a communication which the author proposed to submit in the form of a qualitative scheme. The paper with discussions of it will be found in Chem. and Drug., 1893, 43; also Amer. Jour. Pharm., 1893, 97.

Coal Tar Preparations—Analyses of.—H. Helbing and Dr. F. W. Passmore give an analytical process for coal tar preparations which has given them accurate and reliable results, and admits of a more complete examination of the products than the methods hitherto connectedly published. They give a process for obtaining an approximate idea of the composition of the tar oil. Roughly speaking, the constituents of tar oils may be classified into 3 divisions: (1) The Tar Acids; (2) The Bases; (3) The Hydrocarbons—the determinations of which are given. The information will prove valuable in assisting one in examining and comparing the various coal tar disinfectants, in coming to correct conclusions as to their respective composition, and the percentage of cresols on which depends the value of the preparation as a disinfectant.—Am. Jour. Pharm., 1892, 484-491. Reprinted from Helbing's Pharmacological Record, July, 1892.

Lignite Tar.—By F. Heusler. The lower fractions of the crude tar oil are acted on with explosive violence by nitric acid. After treatment, however, with potassium permanganate, nitration proceeds quietly. Lignite tar oil yields an oil which, on steam distillation and subsequent fractionation, yields benzene, toluene and naphthalene. Derivatives of metaxylene and mesitylene were also recognized among the products of nitration. The fraction boiling at 135-140° of the oil, obtained by treatment with permanganate, contained about 30 per cent. of aromatic hydrocarbons. On nitration of the oil, a certain quantity was always unattacked; this consists of naphthenes.—Am. Jour. Pharm., 1892, 585, 586; Jour. Chem. Soc., 1892, 1075; Berichte, 25, 1665-1678.

Dextran—The Formation of.—W. Braeutigam, in Pharm. Centralh., 1892, 534-538.

Ethers.

Ether.—D. B. Dott, upon the examination of a number of samples of "æther purus," concludes that most of the commercial article contains methyl ether.—Pharm. Jour. Trans., 1893, 617.

Ether—Examination of, for Medicinal Use.—Seiler.—Schw. Wochschr. Chem. Pharm., 1892, 209; Pharm. Post, 1892, 678.

Ether.—By A. C. Abraham. A paper on the history, manufacture, impurities and tests for ethyl ether.—Pharm. Jour. and Trans., 1892, 271–275.

Ether—Examination of.—M. C. Traub.—Abstract, Zeitschr. f. anal. Chem., 1893, 336.

Acetic Ether.—H. L. Leeke. The following tables show how variable the commercial varieties of acetic ether are: "A" is the acetic ether made by the writer; "B" a domestic article of standard manufacture; "C" a foreign sample marked "twice rectified; U. S. Ph. spec. grav. 0.890;" the rest are from various domestic manufacturers:

	A.	B.	C.	D.	E.	F.
Odor	Fruity.	Fruity.	Disagreeable.	Acetic Acid.	Fruity.	Fruity.
Reaction	Neutral.	Neutral.	Acid.	Acid.	Acid.	Neutral.
Residue	None.	None.	None.	None.	None.	None.
Sp. Grav. at 15.5 C.	.8907	.8860	.8835	.8675	.8662	.8622
Boiling Point	72 C.	72 C.	72 C.	73 C.	74 C.	68 C.
Potassium Permanganate	o	o	Decolor.	o	o	Decolor.
Barium Chloride	o	o	o	o	o	o
Silver Nitrate	o	o	o	o	o	o
Fusel Oil	None.	None.	Present.	None.	None.	None.
Separation on mixing 10 C.c. ether and 10 C.c. water	9 5 C.c.	9 C.c.	6 C.c.	3 C.c.	3.6 C.c.	4 C.c.
One part miscible with water	15	8	6	5·5	5·5	5

—Pharm. Review, 1892, 201.

Aceacetic Ether—Constitution of Sodium.—A. Michael.—Jour. f. prakt. Chem., xlvi, Part 4; Abstract, Chem. News, 1893, 133.

Ethyl Acetoacetate.—A. Michael.—Amer. Chem. Jour., xiv, 481.

Ethyl Acetoacetate and Benzoylacetate—Stereoisomeric Dioximes from.—G. Nussberger. Stereoisomerism has heretofore been observed only in mono- and di-carboxy derivatives of aliphatic dioximes.—Ber. d. Chem. Ges., xxv, 2142.

Ethyl Chloracetate—Action of Sodium on.—A. Erlenbach.—Ann. der Chem., 269, 14-48.

Hydrofluoric Ethers.—M. Meslaus finds that etherification of alcohols may be caused by hydrofluoric acid.—Pharm. Jour. Trans., 1893, 609; from Compt. rend., 115, 1080.

Quinone-oxime Ethers.—J. L. Bridge. The results obtained show that the properties and stability of quinone and its derivatives depend entirely on the negative or positive condition of the molecule.—Am. Chem. Jour., xiv, 276.

Detection of Salicylic Acid in Salicylaldehyd and in Salicylic Methylester.—Schneegans and Gerock utilize the circumstance that the above compound produced with ferric salts is permanent on shaking with ether only in case of salicylic acid, whilst in the aldehyd and ester it disappears.—Jour. d. Pharm. von Elsass-Lothringen; Zeitschr. f. Anal. Chem., xxxi, Part 4.

Tartaric Ethers.—P. Freundler.—Compt. rend., Oct. 10, 1892.

Fruit Ethers.—Formulas for the following ethers: Ananas (pineapple), apple, apricot, banana, cherry, currant, gooseberry, grape, lemon, melon, orange, peach, pear, plum, raspberry and strawberry.—West. Drug., 1892, 250; Drug. Zeit., Nov. 8, 1891.

Furfuran Compounds.—A. Pinner.—Ber. d. Chem. Ges., xxv, 1414. Examination of imido-ethers and amidines derived from furfuran. He designates the radical C_4OH_3 "furyl," and the radical C_4OH_2C, "furfur."

Gallanilide and its Triacetyl and Tribenzoyl Derivatives.—Cazeneuve, in Compt. rend., cxvi, 698.

Gallanilide—Formation of.—Its Triacetic and Tribenzoylic Derivatives.—P. Cazeneuve.—Compt. rend., March 27, 1893.

Glaucine.—Battandier describes a method by means of which he obtained brilliant, needle-shaped crystals of the hydrobromide.—Abstract, Jour. Chem. Soc., 1892, 893.

Guaiacol—Synthetic.—Béhal and Choay, in Rep. de Pharm., 1893, 101.

Creosote.—See Creosote.

Glucose.

Glucose—Composition, Nature and Properties of.—Abstract of report of the National Academy of Sciences, in Pharm. Era, 1892, 168:

This industry sprang into existence during the Continental blockade under

Napoleon I, after which it disappeared for some years. It has gradually revived, and is now an established industry both in Continental Europe and in the United States. The irregularity of demand for the product depends largely upon the comparative prices of corn, and of molasses and cane sugar. At the time of the last census the capacity of the factories in the United States was estimated at 43,000 bushels of corn per day. Payen, in 1855, estimated the French production from potato starch at 5,500 tons per year; and Wagner, in 1874, estimated that of the German Empire at 19,800 tons of syrup and 27,500 tons of sugar per year.

The committee reported the following conclusions:

1. That the manufacture of sugar from starch is a long-established industry, scientifically valuable and commercially important.

2. That the processes which it employs at the present time are unobjectionable in their character, and leave the products uncontaminated.

3. That the starch sugar thus made and sent into commerce is of exceptional purity and uniformity of composition, and contains no injurious substances.

4. Though having at best only about three-fifths the sweetening power of cane sugar, yet starch sugar is in no way inferior to cane sugar in healthfulness, there being no evidence before the committee that maize-starch sugar, either in its normal condition or fermented, has any deleterious effect upon the system, even when taken in large quantities.

Glucose.—Abstract in Pharm. Jour. Trans., 1893, 887; from Trans. Inst. Brew., 6, 132.

Synthetic Sugars from Glucose.—Prof. Fischer describes sugars containing 7, 8 and 9 carbon atoms respectively; their compounds with phenylhydrazine and other reagents and the corresponding alcohols and carboxylic acids.—Pharm. Jour. and Trans., 1892, 341; from Annal. der Chem., 270, 64.

Glucose—Estimation of.—Rossel gives a new process in Jour. Pharm. Chim., 1893, 580.

Glucose—Action of Acetic Anhydride on.—According to Istrati and Edeleanu, V. Meyer's aldehyde formula, $OH.CH_2.(CH.OH)_4.COH$, for glucose cannot be correct, because no unsaturated hexabasic acid is obtained when this sugar is heated with acetic anhydride for several days, the only product being the triacetyl derivative.—Abstract, Jour. Chem. Soc., 1892, 1293.

Glycerin.

Pure Glycerin—Extemporaneous Preparation of.—To 100 parts of crude commercial glycerin add 8 parts of sulphate of zinc. Heat, let cool, and add 27 parts of powdered quicklime and stir in. Put into the filter press and filter. The filtrate will be pure glycerin.—Nat. Drug., 1892, 158.

Glycerin—Analysis of.—The following process is suggested by C. Man-

gold: In a liter flask put 300 Gm. of water, 10 Gm. of caustic potash, and from 2 to 4 Cg. of the glycerin to be analyzed. Let drop upon the mixture, gently and with constant agitation and cooling, a 5 per cent. aqueous solution of potassium permanganate, until you have added six times the theoretic quantity needed (87 parts of permanganate to 1 part of glycerin). Let stand for a half hour and then add oxygenated water until the supernatant liquid is colorless, being careful not to add it in excess. Bring the entire volume up to 1 liter by the addition of distilled water, and filter; heat the filtrate to ebullition for thirty minutes to drive off superfluous oxygen, let cool down to 60°, add sulphuric acid, and finally titrate with potassium permanganate.—Nat. Drug., 1893, 168.

——— *Assay.*—M. G. Halphen, in his "Pratique des Essais Commerciaux" gives the following method for the estimation of glycerin in the crude article. Place in a 100-C c. beaker 10 Gm. of the glycerin at temperature of 11° C. (which should be maintained), and dissolve in it 6 C.c. of pure phenol. Then run into the beaker from a burette an aqueous solution of phenol, 50 Gm. to the liter, until a permanent turbidity is obtained. Note the number of cubic centimetres of the aqueous solution employed = N. The quantity of pure glycerin contained in 100 parts of the sample is obtained by the following equation:

$$100 - \frac{28.15 - N}{0.39}$$

The acidity or alkalinity of the sample is determined volumetrically with standard sodium carbonate or sulphuric acid.—Chem. and Drug., 1893, 417.

Arsenical Glycerin.—J. Lewkowitsch. It is stated that arsenic in glycerin cannot be removed by distillation; and the author, who is a manufacturer of glycerin, says he knows no method by which this substance can be rendered free from arsenic on a practical scale. The noxious metal gets in from the reagents used in the manufacture. Pure glycerin, free from arsenic, he says, can only be obtained where reagents, not contaminated with arsenic, are being used. We quote the following passage from this paper: "Glycerin, free from arsenic, will be obtained in these processes where the fats are hydrolyzed by means of water, whether it be used in the liquid state or as superheated steam. The lime saponification, which is yet largely practiced, especially in small works, will, as a rule, also yield an arsenic-free glycerin. On the contrary, all glycerin coming from works where the sulphuric acid saponification is practiced will contain arsenic, as the glycerin will extract all the arsenic from the sulphuric acid."—Chem. News, Jan. 27, 1893.

Quantitative Estimation of Glycerin in Fermented Liquors.—G. Marpmann.—Pharm. Centralh., 1892, 419.

Glycerin—Solid.—Charles Platt.—Science, 1892, 278.

Glycerin of Soap Manufacturers—Detection of Sulphites in the.—C. Ferrier, in Chem. Zeit., 1892, 1840.

Glycerin.—J. Schenkel. An article in the statistics connected with the production and manufacture of glycerin.—Pharm. Review, 1892, 158; from Oil, Paint and Drug. Rep.

Vegetable Hydrocarbons—Natural Synthesis of.—Maguenne.—Abstract, Jour. Chem. Soc., 1892, 7234.

Nitrosoguanidine and Amidoguanidine.—J. Thiele.—Ann. der Chem., 270, 1; Jour. Chem. Soc., 1892, 1295.

Homocatechol and Nitrohomocatechols.—H. Cousin.—Compt. rend., cxv, 234.

Homocatechol—Ethers of.—H. Cousin.—Compt. rend., cxvi, 104.

Imidazoles and the Constitution of Glyoxaline.—W. Marckwald.—Ber. d. Chem. Ges., 1892, xxv, 2354.

Indigo Green.—V. H. Soxhlet. A compound produced by mixing solutions of indigo-carmine and ammonia.—Abstract, Jour. Chem. Soc., 1892, 992.

The Induline Group.—Fischer and Hepp.—Ann. der Chem., 272, 306. The authors class the indulines in four groups.

Iodoform.

Iodoform.—A contribution to the Materia Medica.—Pharm. Centralh., 1892, 563–567.

——— Kinzel assumes from the decomposition of iodoform in a solution of chloroform under the influence of sunlight, the mere presence of iodoform facilitates the action of oxygen upon the chloroform in which it is dissolved, and that the chloroform acts the part of a carrier of oxygen to the iodoform.—Chem. Zeit., 1893, 387.

——— Pure iodoform dissolves in pure menstrua with a yellow color, when both the iodoform and the menstruum are absolutely free from air (iodoform contains about five times its volume of air), but the color begins to darken on exposure. The presence of certain impurities retards the darkening, and solutions of impure iodoform keep better than those of the pure. (Fischer.) A solution of impure iodoform in pure ether does not darken within twenty minutes, but in impure ether it darkens at once.

Spoiled solutions of iodoform are improved by shaking them with a few globules of mercury, which will combine with the liberated iodine.

The solubilities given by the United States Pharmacopœia are correct. In absolute alcohol it is one in thirty, although Allen gives one in twenty-five.

Assay.—On adding iodoform to a solution of nitrate of silver, there will

be formed carbonic oxide, free nitric acid, and iodide of silver; about ninety-nine per cent. of the iodoform will be indicated. Greshoff mixes the various medicaments with the silver solution, frees the iodide of silver from fat, etc., by ether, and finally washes the salt with water, then dries, and weighs.—Meyer Bros.' Drug., 1893, 50.

Iodoform—Estimation of.—H. D. Richmond.—Analyst, 17, 7; Jour. Chem Soc., 1892, 1528.—Greshoff.—Pharm. Centralh., 1893, 232.

Iodoform—Solubility of.—The solubility of iodoform in alcohol and ether, as stated in the various pharmacopœias showing considerable discrepancy, G. Vulpius redetermined these, finding that 67 parts of an alcohol of 90.5 per cent. by volume at 17° to 18° C. dissolved one part iodoform; at the boiling point only 9 parts of this alcohol were required; to dissolve one part iodoform 5.6 parts cold ether were needed.—Pharm. Centralh., 1893, 117.

Action of Iodoform on the Additive Product Obtained from Sulphurous Anhydride and Sodium Phenoxide.—Schall and Uhl.—Ber. d. Chem. Ges., xxv, 1875.

Alteration of Iodoform Preparations.—When iodoform is dissolved in liquid cacao butter, and the mixture allowed to solidify, exposure to the light will soon cause a reddish coloration. H. Barnouvin (Jour. de Pharm. et de Chim., 1893, 274) finds that while fluid preparations show this change even in the dark, solid iodoform preparations remain unaltered indefinitely if exposure to the light is avoided.

Iodoform Deodorizer.—The essential oil of coriander in the proportion of eight drops to one drachm of iodoform. It should be thoroughly incorporated by trituration.—Merck's Bull., May, 1892, 284.

——— The Phar. Zeit. recommends the addition of one-half per cent. of carbolic acid, and one per cent. of essence of peppermint.—Phar. Jour. Trans., 1893, 686.

——— According to Revue des Inventions techniques (Monit. de Pharm., 1892, 1138) oil of turpentine acts as a strong deodorant for vessels to which the odor of iodoform adheres. The vessels are well covered with turpentine (only a thin layer is necessary), and in about a minute are washed with soap and water (acts very nicely.—H. C. C. M.) Also Am. Jour. Phar., 1891, 404; 1892, 571.

——— The supplement to the Netherlands Pharmacopæia gives the following formula for disguising the odor of iodoform:

Take of

Iodoform	197.0
Carbolic acid	1.0
Oil of peppermint	2.0

Mix.

Iodoform Deodorizer.—Apparatus in which iodoform preparations have been made can be freed from every trace of the odor by the addition of a few drops of laurel oil before cleaning the apparatus with saw-dust. The odor of the laurel oil disappears in a very short time.—F. K., Pharm. Ztg., 1892, 396.

Deodorization of Iodoform, Creosote and Guaiacol.—(Deutsch. med. Zeit.; Med. News.) The odor of iodoform, creosote or guaiacol upon the hands can be overcome by washing with linseed meal. Articles having an odor of iodoform may be washed in tar-water to which oil of wintergreen has been added. The taste of pills of creosote can be disguised by means of a little powdered coffee. The odor of iodoform or guaiacol in rooms can be dissipated by burning coffee.

Iodoformed or Iodolated Essence of Turpentine.—The local antiseptic treatment of pulmonary phthisis by Dr. Delthil. A study of the following remedies in a mixture: Essence of turpentine, 350; of spikenard, 100; iodol, 8–10, or iodoform, 8–10; and sulphuric ether, 20, inhaled from a bottle through a tube furnished with a mouth-piece.—Jour. de Méd. de Paris, 1892, 426; Am. Jour. Med. Sci., 1892, 714.

Ketones.

Acetone.—See under Acetone.

Aldehyde and Ketone.—See under Aldehyde.

Ketones with Phenols—Consideration of.—Dianin.—Abstract, Jour. Chem. Soc., 1893, 214.

Aromatic Alkyl Ketones.—Claus, in Jour. f. prakt. Chem., 46, 474.

Aromatic Ketones.—Stockhausen and Gattermann, in Ber. d. Chem Ges., xxv, 3535.

Aromatic Tetraketones.—Abenius and Söderbaum.—Ber. d. Chem. Ges., xxv, 3468.

Carbonyl Oxygen of the Aldehydes and the Ketones—Determination of. H. Strache in Monats. f. Chem., 12, 524. Illustrated.

Ketones.—Pharmacological research by M. Albanese and E. Barabini.—Sicilia med., Torino-Palmero, 1891, 499; Trans. Arch. ital. de Biol., Turin, 1892, 231.

Acetoxine.—Pharmacological research by H. Paschkis and F. Obermayer.—Sitzungsb. d. k. Akad. d. Wissensch. Math.-naturw. Cl., Wien, 1892, 299.

Lignite Tar.—See Destructive Distillation.

Menthene.—F. A. Sieker and E. Kremers. A study of menthene and its nitroso-chloride derivatives.—Am. Chem. Jour.; Drug. Circ., 1892, 187.

Metol—A New Photographic Developer.—It occurs as a salt of mono-

methylparaamidometacresol, and is in form of a white powder, soluble in water. Its aqueous solution in presence of sodium sulphite is almost colorless, and keeps for several weeks without decomposing if preserved in well-closed vessels. This solution remains colorless in presence of alkaline carbonates, and is recommended as an active quick developer for silver-bromide gelatine plates. A suitable developer consists of—Solution A: water, 1000; sodium sulphite, 100; metol, 10. Solution B: water, 1000; potassa, 100. 60 parts of solution A are mixed with 20 parts of solution B. For slow development water may be added to the mixture of the two solutions and less of the potassa taken. For rapid development the amount of potassa may be increased. The metal developer does not stain the skin. Soda in place of potassa will work as well, excepting that it requires more time.—Pharm. Record, 1892, 145.

Muscarine.—Nothnagel.—Ber. d. Chem. Ges., xxvi, 801.

Naphthenes and their Derivatives in the General System of Organic Compounds.—V. Markovnikoff. The first part of a review of our knowledge of the naphthene and naphthylene hydrocarbons. Inasmuch as they differ in many respects, both from the aliphatic and aromatic hydrocarbons, the author regards them and their derivatives as constituting a third general class of organic compounds.—Jour. f. prakt. Chem., xlv, 561.

Isomeric Naphthaline Derivatives—Sixth Report of the Committee Appointed for the Purpose of Investigating.—Chem. News, 1892, 189.

Perfumed Naphthalin.—Oil of bergamot and camphor have been used. Dieterich now recommends the following formula: Mix naphthalin, 3000 parts; camphor, 1000; coumarin, 2; oil of neroli, 1, and nitrobenzol, 10. —Jour. de Pharm. d'Anvers, 48, 422.

Methylnaphthalines.—A critique by G. Wendt on H. Wichelhaus' paper (Ber. d. Chem. Ges., xxiv, 3918).—Jour. f. prakt. Chem., xlvi.

α- and β-Naphthylamine Containing asymmetrical Nitrogen and Carbon Atoms—Derivatives of.—C. A. Bischoff and A. Hausdörfer.—Ber. d. Chem. Ges., xxv, 3263.

Dihydroxydiketotetrahydronaphthalene—The Azines and Eurhodoles obtained from.—Zincke.—Ber. d. Chem. Ges., xxvi, 613.

Naphthols—Condensation of Formaldehyde with.—J. Abel, in Ber. d. Chem. Ges., xxv, 3477.

——— *Condensation of Chloral Hydrate with.*—Abstract, Jour. Chem. Soc., 1893, 173.

Recent Work on Nitrogen Compounds.—J. T. Conroy.—Pharm. Jour. Trans., 1893, 640.

Oxyazo-Compounds.—Goldschmidt and Pollak consider the reduction of other hydroxyazo-compounds, of disazo-compounds of the type of phenol-disazobenzene, of azo-compounds derived from resorcinol, and of the acetyl-derivative of benzeneazoacetone.—Ber. d. Chem. Ges., xxv, 1324.

Pentene Derivatives into Indene Derivatives—Conversion of.—Zincke and Günther.—Ann. der Chem., 272, 243.

p-Phenetidins—New Method of Preparation.—Pharm. Centralh., 1893, 67. 14.5 parts of the hydrochloride of p-amidophenol, previously dissolved in 100 parts of water are treated with 13.6 parts of crystallized sodium acetate and 10.6 parts of benzaldehyde. After considerable stirring the benzylidin compound of p-amidophenol separates. For preparing the ethyl compound of the same, 12 parts are treated with 10 parts of alcohol (95 per cent.) and 6.8 parts sodium hydrate solution (containing 35.6 per cent. NaOH), in an autoclave at 100° for three hours. Upon cooling the ethyl compound separates in beautiful yellow prisms. It is insoluble in water, sparingly so in warm alcohol and quite soluble in ether and benzol. By mineral acids this compound is split into benzaldehyde and phenetidin. The acid compound is separated by distillation with water. In the residual solution para-phenetidin is obtained by separation with ether or benzol.

Phenol.

Carbolic Acid, Crude, Assay of.—Into a large beaker glass are weighed 100.0 parts each of the carbolic acid and of milk of lime (made by slaking one part of lime with five parts of water), the vessel placed in a steam-bath and heated for one hour with frequent stirring; an equal volume of water is then added and the mixture thoroughly stirred. The tarry and resinous constituents by this treatment form insoluble calcium combinations, while the phenol and cresol enter solution and the volatile substances are dissipated. After cooling the mixture is filtered, the residue washed with water and the filtrate decomposed by the cautious addition of hydrochloric acid; to easily separate the phenol and cresol, the aqueous solution is saturated with salt, this causing the phenols to float upon the brine; after removing the phenols they are weighed without further purification. The commercial designation of crude carbolic acid is based upon the solubility in soda solution, an acid being called 100 per cent. if it dissolve clear in the soda solution. Treated by the above process, commercial crude carbolic acid of 25–30 per cent. assayed 2–3 per cent; 40–60 per cent. assayed 3–5 per cent.; 80 per cent. assayed 50 per cent., and specimens marked 90–100 per cent. assayed 80 per cent. of phenol.—F. Seiler; Schwz. Wochenschr. f. Chem. u. Pharm., 1892, 365; Am. Jour. Pharm., 1892, 566.

——— The above method has been criticised as not being correct, the chief source of error being due to the fact that no allowance is made for the solubility of the phenols in the salt solution. P. Solmann, in Pharm. Ztg., 1892, 679, gives a method carried out by distilling 100 C.c. of the crude phenols and measuring the fractions, allowance being made for water which may be present to the extent of 10 per cent.; the method is stated to be used by the manufacturers in determining the quality of the

acid before offering it for sale; the assay can be completed in half an hour. The results obtained in the analysis of three samples will explain themselves:

	I.	II.	III.
Boiling commenced	103° C.	100° C.	100° C.
Distillate up to 160° C.	9.5	9.0	11.0 C.c.
(including	1.5	7.5	9.0 C.c. water.)
" " 185° C.	2.5	2.0	1.0 C.c.
" " 195° C.	38.0	49.0	70.8 C.c.
" " 200° C.	30.0	30.5	11.5 C.c.
" " 205° C.	16.0	3.7	2.8 C.c.
	96.0	94.2	97.1 C.c.
Less the water	1.5	7.5	9. C.c.
Phenols soluble in alkali	94.5	86.7	88.1 C.c.
Tar oils by difference	4.0	5.8	2.9 C.c.

—Am. Jour. Pharm., 1892, 614.

Phenol—Volumetric Estimation of.—L. C. Urban compares the relative value of three methods of titrating phenol, viz.: with standard bromine solution; standard solution of $5NaBr+NaBrO_3$; and standard iodine solution. The following determinations of phenol in the glycerite and in Souley's carbolic liniment were made:

Estimation of Phenol in the Glycerite Containing 20 per Cent. of Commercial Phenol.—6.7265 Gm. of the glycerite was distilled with water vapor until the distillate no longer gave a reaction for phenol. About 135 C.c. of distillate was thus obtained. 3 Gm. of sodium hydroxide were added to the distillate and the solution diluted to 500 C.c. 25 C.c. were used for one estimation. Three estimations required 41.4 C.c., 41.8 C.c., and 41.85 C.c. of a $\frac{n}{10}$ iodine solution, corresponding to 19.27 per cent., 19.46 per cent., 19.48 per cent., respectively. Theoretically 19.61 per cent.

Estimation of Phenol in Carbolic Liniment Containing 11.53 per Cent. of Commercial Phenol.—5.0616 Gm. of liniment were first treated with a solution of sodium hydroxide and heated on a water-bath until all traces of camphor had disappeared. It was then acidulated and distilled with water vapor until the distillate no longer gave a reaction for phenol. In order to determine the rapidity with which the phenol passes over, the distillate was collected in portions of 50 C.c. each and the amount of phenol estimated in each portion. Three portions were thus obtained. These were made alkaline and diluted to 200 C.c., of which 25 C.c., was used for one estimation.

	No. C.c. $\frac{n}{10}$ iodine solution required.	Per cent. of phenol to amount of original substance.	Per cent. of phenol in distillate of the entire amount of phenol present.
First.....	30.7	7.60	
	30.45	7.53	
	30.6	7.57	
Average.....		7.57	66.64
Second	13.55	3.35	
	13.65	3.37	
	13.60	3.36	
Average.....		3.36	29.57
Third.....	1.90	0.47	
	1.60	0.39	
	1.75	0.43	
Average.....		0.43	3.78
Total.....		11.36 per cent.	99.99 per cent.

Thoretically 11.30 per cent.

Although about two-thirds of the phenol passes over in the first 50 C.c. of distillate, the necessity of obtaining a relatively large amount of distillate is apparent, owing to the comparative slowness with which the last portions of the phenol are driven over.—West. Drug., 1893, 9.

Phenol—Alkalimetric Estimation of.—R. Bäder in Zeitschr. f. Anal. Chem., 1892, 58.—Pharm. Centralh., 1892, 479. The author finds that if to an aqueous solution of pure phenol mixed with a few drops of an alcoholic solution of symmetric trinitrobenzol we drop in slowly dilute soda solution, the liquid remains colorless as long as free phenol is present, but the slightest excess of alkali is recognized by a distinct "onion-red" color. The solution of trinitrobenzol required is prepared by shaking up repeatedly a knife-pointful of pure symmetric trinitrobenzol (melting-point 122°) with 50 C.c. of absolute alcohol, and filtering. It must have only a very faint yellowish color, and must be preserved in a dark place. For determining phenol in a watery solution he proceeds as follows: He prepares a colorless solution, not too dilute, containing, if possible, not less than 20 Gm. per litre; of this 50 C.c. are poured into a beaker, and there are added 2 or 3 drops (not more) of the trinitro-solution above mentioned. The liquid must remain perfectly clear and colorless. Thereupon normal soda is allowed to run in drop by drop, whilst the beaker is constantly shaken. Towards the end of the reaction the liquid takes a scarcely perceptible yellowish tint. When this point in reached the titration is best continued in the following manner: 2 or 3 drops of soda-solution are added at once, the glass is shaken up, and this is repeated until the reddish-yellow color produced by the soda no longer disappears. The last 3 drops

must be deducted from the total quantity of the normal soda consumed. The end of the reaction is best recognized if we place the beaker during the experiment upon a white porcelain plate. As regards the accuracy of the results, they leave nothing to be desired if the solutions of phenol are sufficiently concentrated.

Phenol—Detection of.—Lambert applies the color reaction obtained on dissolving iodoform in the phenol in question and adding potassa lye.—Abstract in Chem. News, 1893, 253.

Phenols—Action of Chlorine on.—T. Zincke. A continuation of the study of the products obtained from the so-called heptachlororesorcinol.—Ber. d. Chem. Ges., xxv, 2219; xxvi, 311 and 498.

Unsaturated Hydrocarbons with Phenols—Condensation of.—Koenigs and Mai.—Ber. d. Chem. Ges., xxv, 2649.

Phenol—Reactions with Iodine.—T. R. Carswell deals at great length with the action of iodine on phenol in alkaline solutions, and specially refers to the determination of this substance volumetrically.—(Brit. Pharm. Conference.) Pharm. Jour. Trans., 1892, 167.

Acidum Carbolicum Liquefactum.—The chilling point of mixtures of phenol and water is noted as follows:

100	parts	phenol	and	10	parts	of water ..... 11.6° C.
100	"	"		11	"	" ..... 10.2°
100	"	"		12	"	" ..... 9.0°
100	"	"		13	"	" ..... 7.5°
100	"	"		14	"	" ..... 6.0°
100	"	"		15	"	" ..... 4.5°
100	"	"		20	"	" ..... 2.2°

—Pharm. Zeit; Pharm. Post, 1893, 247.

Amido-Phenols.—Lumière and Seyewetz describe a new method of obtaining amido-phenols in a pure state.—Compt. rend., cxvi, 1202.

Crude Carbolic Acid and Wood Tar.—The use of crude carbolic acid and wood-tar for disinfecting purposes is rather wasteful, because of their insolubility in water. E. Hirschsohn, in a series of experiments, found that if 100 parts of so-called 100 per cent. crude carbolic acid was agitated with 50 parts moderately finely powdered rosin and 6–8 parts sodium hydrate dissolved in 12–16 parts of water until solution resulted, a liquid was obtained giving an almost clear solution with ten volumes of water. The solution resembles "Lysol," differing from it, however, in not being miscible with petroleum-ether, and in not producing the gelatinous mass upon addition of two or three volumes of water. Experiments with so-called 50 per cent. crude carbolic acid did not give a preparation dissolving perfectly in water; using the same proportions as above, the preparation resembled "creolin," giving with water an emulsion.

In experimenting with wood-tar it was found that the same formula would not give satisfactory preparations with the different kinds of tar. While in the case of birch-tar the above proportions proved satisfactory, fir tar required an entirely different formula. The best results were obtained by using 100 parts of fir-tar, 10 parts rosin and 6–7.5 parts sodium hydrate dissolved in 12–15 parts of water. These preparations do not give entirely clear dilutions with water, but upon prolonged standing neither an oily nor tarry layer separates.

While heat is not essential for success, it facilitates the solution of the rosin in the carbolic acid and tar; the sodium hydrate, however, must be dissolved in the specified quantities of water, or inferior preparations will result. Attention is called to the fact that crude carbolic acid is met with, which will give good preparations with less rosin and sodium hydrate. Other oils, like oil of turpentine and oil of eucalyptus, can be made miscible by following the above directions.—Pharm. Ztschr. f. Russl., 1893, Nos. 8 and 9.

——— Using the so-called 100 per cent. crude carbolic acid, a product results soluble in any portion of water, and makes a clear solution with petroleum ether. Using the 50 per cent. carbolic acid it was impossible to get a product dissolving in water or even forming an emulsion. Birch-tar, by the modified formula, gave an almost solid mass, which, with water, gave, after some time, a turbid solution; but, here again, no proportions could be ascertained so as to make a clear solution. Fir-tar, however, by the modified formula, gave a satisfactory preparation.—E. Hirschsohn, Pharm. Ztschr. f. Russl., 1893, 148; Am. Jour. Pharm., 1873, 221, 289.

Creosote—Estimation of, in Creosote Preparations.—A. Schlicht, in Pharm. Zeit., 1893, 63; Pharm. Centralh., 1893, 138.

——— *In Creosote Pills.*—C. Monheim.—Pharm. Centralh., 1893, 219.

Some Defects in the Tests of the Pharm. Austr. VII.—G. Hell.—Pharm. Post., 1892, 997. Criticisms upon Creosote and the Determination of Morphine in the different opium preparations of the VII. Oesterr. Pharm.

Crude Petroleum.—Crude petroleum has been used by Larcher in diphtheritis in the of form gargle and of protective covering (badigeonnage). The author's conclusions are that crude petroleum is a good agent and frequently successful in the disease, and that its use causes no inconvenience. With 42 patients the treatment varied from 8 to 18 days, and no cases of contagion were observed.—Am. Jour. Pharm., 1893, 17.

Phenolphthalein.—Friedländer has endeavored to ascertain how the salts of such a colorless substance should be coloring matters if they are formed by the simple substitution of a metal for the hydrogen of one of the hydroxyl groups.—Ber. d. Chem. Ges., xxvi, 172.

Phenylhydrazine—Oxidation of, with Fehling's Solution.—Strache and Kitt.—Abstract, Jour. Chem. Soc., 1892, 1322.

Phenylhydrazine—Action on Carbamide.—Edeleanu.—Ibid., 1323.

——— *Inorganic Derivatives of.*—Michaelis.—Ann. der. Chem., 270, 108.

Paralkyloxy-derivatives of Phenylhydrazine, Hydracetine and Antipyrine.—J. Altschul has been working on the same compounds as Stolz, and claims priority.—Ber. d. Chem. Ges., xxv, 1842.

Phenylmethylpyrazolon.—Preparation and representation.—W. Wislicenus in Pharm. Centralh., 1893, 161.

p-Oxyphenylurethane—Acetyl and propionyl derivatives of.—Pharm. Centralh., 1893, 138.

Phthalazine and Isoindole—Derivatives of.—Gabriel and Neumann.—Ber. d. Chem. Ges., xxvi, 521.

Pyrogallol.—Cazeneuve finds that gallic acid is decomposed at about 120° C., when it is in combination with aniline, forming long needles of aniline pyrogallate. This salt is very unstable, giving off aniline even by exposure to air. Benzene decomposes the salt in the cold. After recrystallization from boiling toluene, the pyrogallic acid thus obtained was found to melt at 132° C.—Jour. de Pharm. et Chim., xxvi, 198; Phar. Jour. and Trans., 1892, 263.

Pyrogallol—Constitution of.—De Forcrand.—Compt. rend., cxv, 284.

Sodium Pyrogallol.—De Forcrand.—Compt. rend., cxv, 46.

Quercetin Derivatives.—Herzig and v. Smoluchowski.—Abstract, Jour. Chem. Soc., 1893, 413.

Dihydroquinazolines—Formation of.—A New Example of Intramolecular Transposition.—O. Widman.—Abstract, Jour. Chem. Soc., 1893, 438.

Isoquinoline.—Pomeranz has discovered a new method of its preparation.—Wiener Monatsh., xiv, 116; Pharm. Jour. Trans., 1893, 2.

Aceto-resorcin.—H. Causse obtained aceto-resorcin by the action of acetone upon resorcin in small, prismatic anhydrous crystals, melting at 212–213°, insoluble in water, benzin, chloroform and ether, soluble in caustic alkalies and carbonates. Its formula is $C_{10}H_{16}O_4.H_2O$.—Jour. Pharm. Chim., 1892, 106. Also Compt. rend., cxv, 49.

Diiod-resorcin-monosulphate.—Pharm. Centralh., 1892, 582.

Ketochlorides of Resorcinol and Orcinol into Pentene Derivatives—Conversion of the.—Zincke and Fuchs.—Ber. d. Chem. Ges., xxvi, 513.

Starch.

Starch—Determination of.—Guischard, in Bull. Soc. Chim.—Abstract, in Pharm. Jour. Trans., 1893, 2.

Starch—Action of Hydrogen Peroxide on.—A. V. Asboth, in Chem. Zeit., 1517 and 1560.

Starch—Higher Nitro-derivatives of.—O. Mühlhäuser.—Abstract Jour. Chem. Soc., 1893, 6.

Starch with Iodine—Combination of.—Rouvier finds that iodine and starch readily combine in presence of alcohol, when the amount of iodine present in the form of an iodide is not more than 3 per cent. of the total quantity of the iodine.—Compt. rend., cxiv, 749.

Iodide of Starch.—G. Rouvier's results agree with those of Mylius, who found that the product of the action of an excess of iodine on starch is $(C_6H_{10}O_5)_4I$.—Compt. rend., cxiv, 1366; Jour. Chem. Soc., 1892, 1171.

Amylum Iodatum.—Preparation by Hager and administration by Werbitzky.—Pharm. Zeitschr. f. Russl., 1892, 604; Zeit. Oest. Apoth. Ver., 1892, 799.

Starch.—Process for estimation in cereals by Guischard.—Abstract, Jour. Chem. Soc., 1893, 249.

Starch—Product of the Oxidation of.—P. Petit. Compt. rend., cxiv, 1375; Jour. Chem. Soc., 1892, 1171.

Determination of Starch and Action of Dilute Acids upon Cellulose.—Guischard.—Bull. Soc. Chim. de Paris; Abstract, Chem. News, 1892, 207.

Cellulose—Nutritive Value of.—Zuntz gives a critical review of those researches which have attempted to show that cellulose has any great nutritive value.—Pflüger's Archiv., 49, 477.

——— *Action of Dilute Acids on.*—Winterstein.—Abstract, Jour. Chem. Soc., 1893, 127.

Diastase on Starch—Non-Crystallizable Products of the Action of.—A. Schiffer.—Chem. Centralb., 1892, 825.

Dextrose.—A. Wohl.—Ber. d. Chem. Ges., xxvi, 730.

Glycogen.—S. Fränkel.—Pflüger's Archiv., lii, 125; Jour. Chem. Soc., 1893, 386.

Sugars.

Sugar Group—Recent Work on.—The carbohydrates of the sugar group and the compounds related to them have formed a subject of a great deal of the recent work of Emil Fischer and many other workers, and in view of the frequent publication of fresh results, a concise account of the more important portions of the work that has hitherto been done is given in Pharm. Jour. Trans., 1892, 348.

Sugar—The Synthesis of.—W. E. Stone.—Chem. News, 1892, 165, 179 and 194.

Sugar Analysis.—From Official Methods of Analysis of the Assoc. of Agric. Chem. for 1890–91.—Chem. News, 1892, 43, 59, 72, 81.

Aromatic Sugars.—Fischer and Stewart.—Ber. d. Chem. Ges., xxv, 2555.

Glucose—A New Reaction for.—O. Rosenbach. On heating a cold saturated solution of sodium nitroprusside with alkali, glucose and lactose give a deep brownish-red or orange color.—Abstract, Zeitschr. f. Anal. Chem., 1892, 724; from Centralbl. f. klin. Med., xiii, 257.

Grape Sugar and Its Isomers—The Configuration of.—W. E. Stone.—Chem. News, 1892, 247.

Inversion of Cane Sugar.—A. Béchamp. On the spontaneous inversion of cane sugar in an aqueous solution and on the cause of this inversion, apparently spontaneous, under the influence of light.—Bull. Soc. Chim. de Paris, ix and x, No. 2; Chem. News, 1893, 168.

Phenyltetrose.—E. Fischer and A. J. Stewart have obtained a sugar to which they give the name phenyltetrose.—Ber. d. Chem. Ges., xxv, 2555.

Sugar from Linseed.—W. Bauer.—Abstract, Jour. Chem. Soc., 1892, 1293.

Sucrose, Dextrose, Levulose.—F. G. Wiechmann. Their quantitative determination when occurring together.—School of Mines Quart., xiii, No. 3.

Sugar Solutions—Preventive against Fungus Growth in.—L. C. Fink shows beyond doubt that the presence of one-half grain of salicylic acid in each ounce of sugar solutions is an absolute safeguard against the formation of fungus; the liquid having remained perfectly sweet and transparent after exposure for one year.—Bull. Pharm.; Meyer Bros.' Drug., 1892, 239.

Grape Sugar—Estimation of.—A. W. Gerrard points out that when Fehling's solution is made with a double amount of copper sulphate, and 100 C.c. of it is treated with 3.3 Gm. of cyanide of potassium, it retains its original sugar value, but during reduction gives no precipitate except on the disappearance of the blue color.—(Brit. Phar. Conference); Phar. Jour. and Trans., 1892, 208; Phar. Review, 1892, 233.

Sugar—Solubility of in Water.—The solubility of sugar in water has been re-examined by Herzfeld (Zeit. für Rübenzuckerind.), who furnishes the following table:

Temperature. Degrees C.	Sugar. Parts.	Temperature. Degrees C.	Sugar. Parts.
0	64.18	55	73.20
5	64.87	60	74.18
10	65.58	65	75.18
15	66.32	70	76 22
20	67.09	75	77.27
25	67.89	80	78.36
30	68.70	85	79.46
35	69.55	90	80.61
40	70.42	95	81.77
45	71.32	100	82.97
50	72.25		

—Western Drug.

Caramel.—W. H. McGrath. An account of its manufacture. Results in making caramel from sugars of 33 different refineries, with tests for phosphoric acid and staying power of color.—Chem. and Drug., 1893, 8.

Tar.—See Destructive Distillation.

Toluic Sulphinide ("Methylsaccharin").—O. Weber.—Ber. d. Chem. Ges., 1892, xxv, 1737.

Paratoluidine in Commercial Toluidines—Methods Proposed for Determining.—F. F. Raabe.—Chem. Zeit.; Abstract, Chem. News, 1892, 109.

Metamidodialkylorthotoluidines and their Conversion into Methylene-blue Dyes.—A. Bernthsen.—Ber. d. Chem. Ges., xxv, 3128, 3366.

Benzoquinone and Toluquinone—Additive Products of.—T. H. Clark.—Amer. Chem. Jour., xiv, 553.

Xylose—Notes on.—W. E. Stone and W. H. Test.—Am. Chem. Jour., 1893, 195.

CHEMISTRY (APPLIED.)

Albuminoids.

Albuminoids, Differentiation of.—M. Duclaux suggests that if certain albuminous precipitates were called *nucleo-albuminines*, that from quinine solution might be called *nucleo-quinine*. With slightly altered conditions he obtained precipitates, which he tentatively names *globulo-quinine* and *albumino-quinine*, from their analogy to globulins and albumins.—Phar. Jour. and Trans., 1892, 83; Annales de l'Institut. Pasteur, vi, 5, 369.

Butter.

Butter Analysis.—E. Schmidt and Partheil, at the meeting of the Apotheker Verein in Hamburg, gave a method for butter analysis.—Apoth. Zeitung., vii, 435; Phar. Jour. and Trans., 1892, 262.

Butter Analysis—Use of Barium Hydrate in.—E. Laves.—Arch. der Pharm., 1893, 356.

Butters—Microscopical Examination of Pure and Unadulterated.—Jean Ferdinand. In a paper, read before the Société Francaise d'Hygiène, the author points out that under the microscope a pure butter shows round, regular fat cells. If this pure butter has not been carefully prepared, we note, in addition, granular masses of casein and albuminous matters, together with occasionally (especially as this butter does not keep well) the spores or filaments of penicillium. Margarine (animal fat), on the other hand, shows under the microscope crystals, separate or in groups. These crystals are very characteristic, and are seen to much better advantage if examined with polarized light, in which case the crystals

show up brilliantly, whilst the ordinary fat-cells are dark or black. By using a selenite plate in addition, the effect is still more remarkable—the crystals showing up of different brilliant colors (principally orange and red) upon a blue ground-work. Pure butter, melted down and allowed to cool, if examined with a selenite plate and polarized light, shows large cells, each cell divided into four segments by a black cross. Two of the segments are greenish and two are orange-yellow, whilst the ground-work is violet-blue. We have thus an extremely simple and trustworthy method for the examination of butters with a view to finding out those adulterated with fats (animal), but it must be remembered that the method is open to errors. Thus, a small amount of melted pure butter may give the characteristics of adulteration. So, too, pure butters that have become rancid. Vegetable fats, again, do not crystallize out like animal fats. Finally, certain butters of very inferior quality may give the appearances of adulterated butters; but, notwithstanding all this, the method is a very useful and simple one for deciding at once between butters that are manifestly pure and those which are impure, and may require further examination by means generally adopted by analysts.—Jour. d'Hygiène, Aug.; Med. Chron., 1892, 43; Am. Jour. Pharm., 1892, 636.

——— *Examination.*—H. Kreis, in Schweiz. Wochenschr. f. Chem. u. Pharm.; Pharm. Centralh., 1893, 12.

Butter Testing—A Modification of Kreis' Method.—C. Micko, in Zeits. Oest. Apoth. Ver., 1893, 73.

——— Dr. B. Fisher. Description of operations by means of which indications are to be obtained of the purity of butter.—Pharm. Zeit., 1892, 439; Phar. Jour. and Trans., 1892, 90.

Butter Examinations.—F. J. Wulling. A compilation.—Drug. Circ., 1893, 101.

Butter—Determination of Water in.—Wibel, in Zeitschr. f. angew. Chem.; Pharm. Jour. Trans., 1893, 3.

Butter—Acids of.—E. Koefoed (Abstract, Jour. Chem. Soc., 1892, 1113). The results show that the acids of butter, other than $C_nH_{2n}O_2$, are oleic acid, an acid $C_{15}H_{28}O_2$, and, most probably, Gottlieb's oxyoleic acid $C_{19}H_{34}O_3$ (?).

Butter—Volatile Fatty Acids of.—H. D. Richmond. Note on a recent paper by W. Johnstone. Chem. News, 1892, 235. Reply, ibid., 281.

——— *Reichert Process for.*—H. D. Richmond, ibid., 251.

——— The volatile acids in butter, according to J. Pinette (Chem. Zeit., 1893, 395), are expeditiously determined by a modification of Dr. Kreis' method; to 5 Gm. of the melted and filtered butter placed in a flask are added 10 C.c. of concentrated sulphuric acid. The butter dissolves at once in the acid with liberation of sulphurous acid. After the

solution becomes colorless and transparent, 150 C.c. water are added, and then sufficient permanganate of potassium solution until the red color remains for a few seconds. This causes the oxidation of sulphurous acid and eliminates the source of error in Kreis' method; 110 C.c. are next distilled off and titrated as in the well-known Reichert-Meissl's method.

Butter—Examination of.—Partheil modifies Reichert's process (Pharm. Centralh., xxvii, 61; xxviii, 584) by using glycerin instead of alcohol in the saponification.—Pharm. Centralh., 1892, 524.

——— *Modification of Reichert-Meissl's Method.*—Pharm. Centralh., 1893, 199.

Free Acids in Butter—Estimation of.—Besana in Chem. Zeit., 1892, 410.

Butter Fat.—Schrodt and Kenzold have, during a whole year, made continuous examinations of the butter obtained from more than 200 cows. —Chem. Repert., xx., 228; Pharm. Jour. and Trans., 1892, 262.

Foreign Fats in Butter—Detection of.—J. Erdélyi recommends the use of cymol.—Zeitschr. f. Analyt. Chem., xxxi, Part 4; Ber. d. Chem. Ges., xxv, 875. A solution of 2 C.c. of butter in 6 C.c. of cymol remains clear at 0° C. at least one hour, while any admixture of foreign fats at once causes a perturbation. The difference in time in which pure butter solution becomes turbid and that in which turbidity occurs in mixed fats is so marked that the least falsification is surely detected. The process is as follows: The suspected butter is melted and filtered, and set aside in an ice-box for from twenty-four to forty-eight hours. Two C.c. are then placed in a test-tube that is chemically clean and thoroughly dry, and at least 2 cm. diameter. Add 6 C.c. cymol, and let stand at ordinary temperature for twenty-four hours. The tube is then placed in a vessel full of cracked ice and left for one hour, being removed occasionally for examination.

Fats in Butter—Detection of Foreign.—Bockairy.—Bull. Soc. Chim. de Paris, 49, 331; Zeitschr. f. anal. Chem., 1892, 352.

Butter and Margarin—Action of Concentrated Sulphuric Acid upon.—Havis, in Jour. de Pharm. d' Anvers. April, 1893; Jour. Pharm. Chim., 1893, 582.

Butter—Detection of Margarin.—H. Rodewald.—Abstract, Jour. Chem. Soc., 1892, 1034.

——— Carl Micko.—Zeits. Oest. Apoth. Ver., 1893, 229.

Acid-Butyrometer for Determination of Fats.—N. Gerber, in Chem. Zeit., 1892, 1839. (Illustrated.)

Butter—Sophistication of.—H. W. Wiley.—Jour. anal. and app. Chem., 5, 633.

Olive Oil and Butter.—Raoul Bruelle.—Compt. rend.; Zeitschr. f. anal. Chem., 1893, 253.

Food.

Will Chemistry Enlarge the Circle of Our Food Supply?—Digest of Justus Gaule's article, in Deutsche Revue for Jan., 1893.—Nat. Drug., 1892, 56.

Human Foods.—Instructions for the examination and judicial decision on portions of animal organisms intended for human food.—Zeitschr. f. anal. Chem.; Chem. News, 1893, 221, etc.

Salts Employed as a Condiment by the Population near the Oubangui.—Composition of the.—Dybowski and Demoussy.—Abstract, in Chem., News, 1893, 121; from Compt. rend., Feb. 20, 1893.

Analysis of Food Stuffs.—Editorial, Phar. Jour. Trans., 1893, 612. A consideration of the necessity of milk by biological and chemical methods. It is reported that there is some probability of tuberculosis among cattle being scheduled in the same way as pneumonia now is. Remarks on Lafar's bacteriological study of butter.

Analysis of Non-Starchy Foods (Coarse Fodders, Oil Seeds, and other Residues).—From Official Methods of Analysis of the Assoc. of Official Agric. Chem. for 1890–91.—Chem. News, 1892, 18.

Foods and Drinks.—Results of Examinations made by the Austrian and Vienna Apothecary Societies from Aug. 25, 1891, to Sept. 1, 1892.—Zeits. Oest. Apoth. Ver., 1892, 636, 663.

Preserved Food—Poisonous Metals in.—W. Reuss.—The fact that the amount of lead in the tin coating of vessels for preserved foods, and that in the solder with which they are united, have been limited by law in Germany to 1 per cent. and 10 per cent. respectively, has caused the adoption of vessels closed without a soldered joint, a rubber ring being substituted instead. The author having observed that preserved foods contained in vessels of this description which appeared unexceptionable, were often contaminated with lead, has examined into the cause of its presence, and finds it to be due to the rubber ring employed.—Pharm. Review, 1892, 158; from Chem. Zeit.

Food Preservatives.—Editorial on the legal aspect.—Chem. and Drug., 1892, 49.

Salicylic and Boric Acid as Food Preservatives.—West. Drug., 1893, 64.

Gluten in Wheat.—Balland refutes the hypothesis that gluten is formed by the simultaneous action of water and ferments.—Compt. rend., Jan. 30, 1893.

Lactoserin.—A product produced by converting skim-milk or whey into a portable article of food rich in nitrogenous material.—Jour. Soc. Chem. Ind., 12, 14. (See page 517.)

Lævulose—Food in Diabetes.—According to Külz, inulin and lævulose are perfectly assimilated by persons affected with diabetes mellitus, while

grape sugar passes more or less completely into the urine. Worm-Müller found that after giving large quantities of lævulose not a trace of it could be detected in the urine of diabetic patients. Pure lævulose, quite free from dextrose, has not hitherto been available, owing to the difficulty of preparing it, but in the Schering factory a process has recently been devised by which it can be produced. The material has the form of a white granular mass, soluble in almost any proportion in water, and possessing a pure sweet taste. The sweetening power is said to be greater than that of cane sugar.—Phar. Centralh., 34, 193.

Sterilization of Food.—C. W. Earle states that both clinical and chemical evidence lead to the belief that milk is injured as a food for infants by being heated to any temperature above 80° C.; that pasteurization at a temperature of 70° to 80° destroys the bacilli of tubercle, typhoid and cholera, the pneumococcus of Friedländer and most of the ordinary germs in milk, whilst the milk itself is not injured; lastly, that milk may be pasteurized by simply immersing the vessel containing it in boiling water that has been removed from the source of heat, and leaving it so immersed for half an hour.—Chicago Medical Recorder, iii, 472; Phar. Jour. and Trans., 1892, 263.

Refractometer—Examination of Food with.—Abbé has introduced a Universal Refractometer, which can not only be employed in the examination of butters and essential and fatty oils, but also for determining the refraction equivalents of solid substances, as crystals, solid fats, animal and vegetable tissues. In this modified form the hollow prism is replaced by two prisms, between the surfaces of which the subject for investigation is pressed, so that not only smaller quantities are required, but the prisms can be more readily cleansed. The normal refractive indices of a large number of substances have already been published, and therefore can be applied either for analytical or control purposes.—Bull. Pharm., 1892, 325.

——— Marpman gives results of his examinations of fats and similar substances, ethereal oils and other liquids.—Apoth. Zeit., vii, 312; Zeitschr. f. Anal. Chem., 1892, 472.

Food and Diet in Health and Disease, including a review of many prepared and condensed foods, together with the treatment of obesity and leanness.—J. V. Shoemaker.—Med. Bull., Philada., 1892, 216, 259.

Koumiss Preparations.—D. H. Davies, in Pharm. Jour. Trans., 1892, 301.

Fresh milk	12 oz.
Water	4 oz.
Brown sugar	℥iiss.
Compressed yeast	gr. xxiv.
Milk sugar	℥iij.

Dissolve the milk sugar in the water, add to the milk, rub the yeast and

brown sugar down in a mortar with a little of the mixture, then strain into the other portion. Strong bottles are very essential, champagne bottles being frequently used, and the corks should fit very tightly; in fact, it is almost necessary to use a bottling machine for the purpose, and once the cork is properly fixed it should be wired down. Many failures have resulted because the corks did not fit properly, the result being that the carbonic acid gas escaped as formed, and left a worthless preparation. It is further necessary to keep the preparation at a moderate temperature, and to ensure the article being properly finished the bottles are to be gently shaken each day for about ten minutes to prevent the clotting of the casein. It is as well to take the precaution of rolling a cloth round the bottle during the shaking process, as the amount of gas generated is great, and should the bottle be of thin glass or contain a flaw it may give way. Some few days elapse before the fermentation passes into the acid stage, and when this has taken place the preparation is much thicker. It is now in the proper condition for allaying sickness, being retained by the stomach when almost everything else is rejected.

Malted koumiss can be made as follows:

Extract of malt	℥ iss.
Compressed yeast	gr. xx.
Brown sugar	gr. x.
Milk, to champagne pint.	

Euonymized koumiss is a suitable preparation for use in some cases of derangement of the liver in which food is rejected and an hepatic stimulant is required, combined with a slight sedative. To prepare this add fluid extract of euonymus, ʒiij, to every 16 ounces of the diluted milk, then proceed as with ordinary koumiss.

Coca koumiss could be made by the addition of cocaine hydrochlor. to the milk, and would be specially adaptable in cancer of the stomach.

Aërated Whey, which is a very refreshing drink in cases of fever, and much used in some parts of Germany, could also be manufactured on the same principle as koumiss.

Peptonized Koumiss.—The easiest way of getting a satisfactory preparation is by the adoption of the following formula:

Papaine	gr. vi.
Milk, to champagne pint.	
Compressed yeast	gr. xx.
Brown sugar	ʒ iij.

This does not keep very long.

Meat and Malt Koumiss would constitute a serviceable preparation in consumption.

Chemists dealing in these preparations should impress upon the minds

of their customers the necessity of keeping the bottles in a cool place, and the advisability of using either champagne or soda-water taps, so that the bulk of the gas may not escape with the first draught.

The Life History and Physiological Chemistry of Koumiss.—Gordon Sharp. From the author's extensive labors it is apparent that koumiss is a more complex fluid than one would at first think. The presence of indole and pyrocatechin show that the decomposition which proteids of koumiss undergo is nearer akin to that brought about by putrefaction of proteids than to any of the other forms of decomposition (by acids, heat, etc.). This is strange when we think of its being such a useful agent in the treatment of disease, more particularly dependent on putrefactive bodies.—Pharm. Jour. Trans., 1892, 512.

Slawuta.—Koumiss establishment as well as climatic forest station. Report for 1891. H. Dobrzycki.—Medycyna, Warszawa, 1892, 321, 349.

Milk.

Milk.—Studies upon the Constitution.—L. Vandin, in Jour. Pharm. Chim., 1893, 385.

Human Milk and Cow's Milk.—Prof. Soxhlet. The difference in their composition and the means of correcting them.—Phar. Jour. Trans., 1893, 785; trans. from Münch. Med. Wochenschr; Pharm. Centralh., 1893, 200. The author particularizes the most important chemical and physiological differences between milk and the other kinds of sugars.

Manufacture of Milk—Corresponding to the Mother's.—By F. Vigier, in Rép. de Pharm., 1893, 53.

On the Absence of Cow's Milk from Japan—Its Beneficial Consequences.—A. S. Ashmead.—Science, 1892, 211.

Galactagogue Remedies.—From observations made by Miss Griniewitch (Thesis, in Bull. gén. de Thérap., August 30, 1892) it was demonstrated that the herb of Galega officinalis (goat's rue), the nettle, cumin, anise and fennel are reliable galactagogues, their activity being in the order named. No undesirable effect was observed from these remedies, either upon the women, while taking the medicine, nor the children whom they nursed. The milk was normal in density, a slight increase of fat being noticed. The herbs may be given in the form of extract, while anise and the other fruits may be taken in powder in doses of 1 Gm., from twice to five times a day.—Am. Jour. Pharm., 1892, 605.

The Use of Milk in Artificial Alimentation of Infants is the subject of an essay recently presented to the Paris Academy of Medicine by Henry Drouet, whose observations lead him to the following conclusions:

(1) While some infants readily digest unboiled milk, the digestibility of milk is not in the least diminished, in the large majority of cases, by boiling.

(2) The nutritive power of boiled milk is to a large extent sufficient for the needs of infants.

(3) Boiled milk is preserved unaltered for a longer time than unboiled milk.

(4) Milk is often the vehicle of certain contagious disease-germs.

(5) Among these the germs of tuberculosis are most frequent.

(6) Contagion from that source is prevented by boiling the milk.

(7) It is absolutely indicated that milk intended for alimentation be boiled.—Ibid., 469.

Lactina or Artificial Milk for the Nourishment of Young Animals.—Südd. Apoth.-Zeit., 1893, No. 5 ; Pharm. Post, 1893, 107.

Condensed Milk.—An illustrated article on the manufacture.—Chem. and Drug., 1893, 124.

Milk for Analysis—Preservation of.—J. A. Alén adds potassium dichromate. Five Gm. is sufficient for 250–500 C.c. of milk, the mixture being preserved in closed vessels at a temperature not exceeding + 50°. —Abstract, Jour. Chem. Soc., 1893, 308.

Milk—Cause of the Rapid Curdling, During Thunder Storms.—Liebig considers it due to the high temperature accompanying such atmospheric conditions.—Chem. Centralh., 1892, 490.

Sterilization of Milk at Low Temperatures.—R. G. Freeman.—Med. Record, 1892, 8. A temperature of not less than 70° C. will render milk sufficiently germ-free for infant food. And a temperature of less than 80° C. will not injure milk materially. Pasteurization offers the most rational solution of the question.

Sterilized Milk.—According to Leeds and Conn, the advantages of sterilizing this food are problematical.—Phar. Jour. and Trans., 1892, 86, 87 ; from a Report to the Dairy Commission of the State of New Jersey on "The Preservation of Milk."

Cow's Milk—Process of sterilizing and assimilating the Fat and Serum. —M. A. Zviagintseff.—J. Russk. obsh. ochran. narod. zdraviga, St. Petersb., 1892, 113, 196.

The Druggist as a Supplier of Sterilized Milk.—According to the Phar. Zeit. seventeen out of the twenty-six apothecaries in business in Leipzig have lately added a sterilized milk department to their business, and find it a paying accessory. By their united efforts they feed one hundred babies a day, reckoning each infant to consume seven bottles of sterilized milk every twenty-four hours.—Bull. Pharm., 1892, 538.

Milk, its Acidity or Alkalinity—A Study on the Constitution of.—L. Vandin.—Bull. Soc. Chim. de Paris, 1892, No. 14 ; Abstract, Chem. News, 1892, 210.

Milk—Determination of the Acidity of.—H. C. Plant titrates 50 C.c. of

milk with ¼ normal solution of baryta, using phenolphthalein as an indicator.—Archiv. f. Hyg.; Chem. News, 1892, 311.

Lactic Acid in Milk—Estimation of.—Thörner.—Chem. Zeit., xvi, 1469 and 1519.

Milk Albuminoids—Nomenclature of.—H. D. Richmond objects to Halliburton's "Caseinogen."—Chem. News, 1893, 132.

Separation of the Albuminoids of Milk in the Determination of Lactose —Application of the Metaphosphoric Acid to the.—G. Denigès.—Bull. Soc. Chim. de Paris, 1892, No. 14.

Milk Fat—Leffmann and Beam's Method of Estimation.—H. D. Richmond considers it trustworthy.—Analyst, xvii, 144.

Fat in Milk—Estimation of.—Thörner.—Abstract, Jour. Chem. Soc., 1893, 101.

——— Weiss-Neutomischel gives a new method in Pharm. Zeit., 1893; Pharm. Centralh., 1893, 235.

Determination of Fat in Milk.—E. Gottlieb has modified Rose's Method.—Abstract, Zeitschr. f. anal. Chem., 1893, 252.

Fat in Milk by Schmid's Method—Estimation of.—J. Pinette has slightly modified this process.—Chem. Zeit., xv, 1833.

Fat in Milk by Babcock's Method—Estimation of.—A. W. Stokes.—Analyst xvii, 127.

——— F. T. Schutt.—Ibid., 227.

Milk Fat with Demichel's Lactobutyrometer—Estimation of.—Graffenberger.—Abstract, Jour. Chem. Soc., 1893, 55.

Fats of Milk—New Method for the Determination of.—Liebermann and Szekely.—Zeitschr. f. anal. Chem., 1893, 168.

Butter Fat in Milk—Estimation of.—L. G. Patterson.—Abstract, Jour. Chem. Soc., 1893, 252.

Lactones of Different Milks—Identification and Estimation of.—G. Denigès, in Jour. Pharm. Chim., 1893, 413.

Total Solids in Milk—Estimation of.—H. D. Richmond.—Analyst, xvii, 225.

Amyloid.—A constituent of milk and dairy products. F. J. Herz, in a microscopic examination of milk, cream, cheese of various kinds, and even in what is called chemically pure casein, found structures which in appearance, size and behavior to iodine showed striking similarity to starch. A point of difference was found in the action of boiling water, which failed to gelatinize them; heated they become soft and can be enveloped by casein or gluten, but without forming an intimate mixture, as iodine will sharply define the position of this substance, called "amyloid." It has not been determined if it is a constant constituent of milk, nor if it has any

bearing upon the use of the milk.—Chem. Ztg., 1892, 1594; Am. Jour. Pharm., 1893, 11.

Salt in Milk.—A. Jacobi states, in the Archives of Pediatrics, that common salt should invariably be added to cow's milk when infants are fed upon it, and to woman's milk if it forms solid coagula in the bowels and is indigestible in consequence. Salt, he says, prevents the coagulation of milk by either rennet or gastric juice.—Drug. Circ., 1892, 279.

Sugar of Milk.—G. Denigès has proved the identity of the various sugars obtained from the ass, mare, cow, goat, ewe and bitch, with that of human milk.—Pharm. Jour. Trans., 1893, 887; from Jour. de Pharm. et de Chim., 1893, 413.

Milk Sugar in Milk—Estimation of.—A. H. Gill (Analyst). 25 C.c. of milk are mixed with 15 C.c. of "milk of alumina" and 0.5 C.c. of 25 per cent. of acetic acid added, the mixture stirred and heated five to seven minutes in a water-bath, at the temperature of 85° C.; 100 C.c. of water are now added, and the mixture is heated in boiling water for ten minutes, with frequent stirring. It is thoroughly cooled under the tap, allowed to settle, and decanted through a plaited filter into a 500 C.c. graduated flask, care being taken to bring as little precipitate upon the filter as possible. The operations of boiling and filtering are repeated three times, and the united filtrates made up to 500 C.c. The liquid is then ready for titration by Fehling's solution in the usual way. The "milk of alumina" is prepared by precipitating, at the boiling temperature, 125 grams of ammonia alum with ammonium hydrate, washing the precipitate by decantation and making up to 1 liter.—Drug. Circ., 1892, 255.

Saccharine Matter in Feed—Influence of, on the Composition of Milk.—A. Meyer, in the Milch Zeitung, is of the opinion that the composition of milk fat is largely dependent upon the nature of the fodder, notably in the case of easily soluble carbo-hydrates, which tend to raise the proportion of liquid fatty acids, and thereby depress the melting point of the fat as a whole. The following are his conclusions in detail: 1. A not unimportant quality in butter, as far as its commercial value is concerned, is its consistency. This is especially true in the English market, where soft butters appear to be less esteemed than those of normal consistency. 2. The consistency of butter, although influenced by the process of manufacture, mainly depends on the melting point of the butter fat. 3. The melting point of butter fat is obviously dependent on its composition, so that the presence of a considerable amount of volatile fatty acids, or of non-volatile liquid fatty acids, is disadvantageous. 4. The melting point of butter fat is affected both by the character of the individual animal yielding it and by the breed to which it belongs, and may be influenced by the selection of particular breeds, and by the choice of individuals belonging to them. 5. The melting point of butter fat is also largely de-

pendent upon the fodder, and easily digestible carbo-hydrates, especially saccharin substances, tend to lower the melting point of butter, while fodder poor in soluble carbo-hydrates has the opposite effect.—Nat. Drug., 1892, 42.

Milk Tester—A New.—Pharm. Centralh., 1893, 164.

Peptone.

Chemical Constitution of the Peptones.—P. Schutzenberger.—Compt. rend., July 25, 1892; Abstract, Chem. News, 1892, 281.

Peptone and Peptone Preparations.—Adamkiewicz. Methods of preparation.—Pharm. Post, 1892, 878.

Peptones—Constitution of.—Schutzenberger.—Compt. rend., cxv, 208, 764.

——— *Molecular Weight of the.*—Abstract, Jour. Chem. Soc., 1892, 1501.

——— G. Ciamician and C. U. Zanetti.—Arch. ital. de Biol., Turin, 1892, 371; from Atti d. r. Accad. dei Lincei, 1892, 1.

Albumoses and Peptone.—Kühne.—Abstract, Jour. Chem. Soc., 1893, 233.

Peptone—Determination of.—Hallopeau suggests the use of mercuric nitrate for determining the amount of peptone as being preferable to other methods. By that reagent a white, flocculent and voluminous precipitate of mercuric peptonate is obtained, which separates rapidly and may be washed on a weighed filter until the filtrate no longer gives a reaction with sulphuretted hydrogen. The weight of the dry precipitate, multiplied by the coefficient 0.666, gives the quantity of peptone. Other albuminoids must be previously removed.—Compt. rend., cxv, 356; Pharm. Jour. and Trans., 1892, 182.

Commercial Peptone—Estimation of the Nitrogenous Constituents of.—A. Stutzer (Zeitschr. f. anal. Chem., xxxi, 501). The value of commercial peptones depends essentially on the amount of albumose and peptone they contain. Gelatin and gelatin-peptone, leucin, tyrosin and other decomposition products, are comparatively valueless. The following process is directed to the estimation of these constituents: In all cases, the amount of any precipitate is not found by weighing, but is calculated from the result of a nitrogen estimation by Kjeldahl's process, on the assumption that they all contain 16 per cent. Of dry preparations 5 Gm. is taken; of fluids, 20–25 Gm. This is warmed with 200 C.c. of water, feebly acidified with acetic acid, boiled and filtered, the filtrate being made up to 500 C.c. The filter, with the moist precipitate, is at once submitted to Kjeldahl's process, and a correction is made for the nitrogen in the paper. This gives the amount of unchanged albuminous substances. In a well made preparation these should not be present. The nitrogen in the filtrate

is also determined, and the sum of the two stated as total nitrogen. A fresh portion of substance dissolved in 25 C.c. of water (or, if a liquid, 50 C.c. concentrated to 25 C.c.), is gradually mixed with 250 C.c. of absolute alcohol, and filtered after 12 hours. The filtrate, which contains the gelatin-peptone, the leucin, tyrosin, and other decomposition products, is freed from alcohol and dissolved in water. Any insoluble matter is filtered off, and regarded as albumose. The clear solution is made up to 500 C.c., and 100 C.c. of this, warmed to about 40°, is precipitated with 10–15 C.c. of a paste of mercuric oxide, containing about 15 per cent., and prepared by pouring mercuric chloride into dilute soda, washing thoroughly, and preserving in the dark. After stirring for a few minutes, the mixture is filtered and the nitrogen determined in the precipitate and filtrate. The former contains the gelatin-peptone, with unknown decomposition products of albumose and peptone. The filtrate contains the leucin, tyrosin, and other products of a digestive fermentation which has been carried to excess, together with part of the so-called flesh bases (creatin, etc.), which are very sparingly soluble in 95 per cent. alcohol. Instead of mercuric oxide, phosphotungstic acid may be used. This reagent, used in excess, precipitates none of the flesh bases except xanthin and hypoxanthin, of which, from their sparing solubility, only traces can be present in the alcoholic solution.

The alcohol precipitate containing the albumose, gelatin and peptone is rinsed with water into a beaker and warmed until the alcohol is expelled. Any albumose which has been rendered insoluble is filtered off and washed with hot water. The clear solution is made up to 500 C.c., and of this, 50 C.c. mixed cold with an equal volume of dilute sulphuric acid (1 vol. to 3 vols. of water), is completely precipitated with phosphotungstic acid. The nitrogen in the precipitate gives the joint amount of the albumose, peptone and gelatin. 100 C.c. of the same solution, concentrated on the water-bath to 8–10 C.c., is mixed with 100 C.c. of a cold saturated solution of ammonium sulphate. It is then dissolved in tepid water, and whilst one portion of the solution is used for nitrogen estimation, another is precipitated by barium chloride, to ascertain the amount of adhering ammonium sulphate. (The relation of the ammonia to the sulphuric acid in the solution used should be determined, not calculated.) The corrected nitrogen in the precipitate gives the amount of albumose and gelatin. The peptone is known by difference, its actual presence being confirmed by concentrating the remainder of the solution, precipitating the albumose and gelatin by solid ammonium sulphate, and testing the filtrate by adding a trace of cupric sulphate and a large excess of strong soda solution. Peptone gives a characteristic red color.

The gelatin is best estimated by means of the viscosimeter, the viscosity being compared with that of a standard solution of the best white gelatin, to which an equal volume of a 20 per cent. solution of serum peptone, free

from gelatin, has been added. A 10 per cent. solution of the substance is prepared and cooled for three hours to a temperature lower than that at which the comparison is to be made. It is then gradually warmed to a standard temperature, and immediately examined for viscosity. Very dilute solutions may be compared at 0–1°, whilst strong ones may need to be warmed to 25°, but it is not permissible to warm above the standard temperature, and again cool just before testing. Calling the viscosity of a 10 per cent. solution of serum peptone 100, the addition of 0.25 per cent. of gelatin raises it to 130 at 0–1°, 114 at 15°, 106 at 20°.

Having now ascertained the amount of nitrogen in the alcohol precipitate in the form of albumose, peptone and gelatin, the remaining nitrogen is to be regarded as belonging to the flesh bases. The principal of these is creatin, with 32.8 per cent. of nitrogen, whence the multiplication of the nitrogen by the factor 3.12, gives the total amount of the bases with but small error.—Jour. Chem. Soc., 1893, Abstr., 146.

Peptones in the Gastric Juice—Quantitative Estimation of.—S. Riva Rocci in Centralb. f. Klin. Med., estimates the amount of peptones in the gastric juice by acidifying it with acetic acid, if alkaline, and saturating with sulphate of magnesia. The precipitate is dried at 110° C. and weighed, then incinerated to ascertain the amount of magnesium sulphate which has been added. Fifteen per cent. of the total weight obtained must be added to make up for one molecule of water of crystallization remaining in the sulphate at 110° C. The difference in the two weights is taken to represent the amount of peptones present. Pharm. Record, 1892, 159.

Peptone Salts from Glutin.—Mineral acids act on glutin in a similar manner to pepsin and trypsin, yielding peptones which combine with the acids present to form salts; these dissolve not only in water but also, unlike the free peptones, in absolute ethyl and methyl alcohol. C. Paal has prepared the glutin peptone hydrochloride; two mercuro-chlorides which may, like the mercuro-chlorides of the free peptones, be employed for therapeutic purposes. The author's experiments agree completely with the supposition that the glutin peptones are products of hydrolysis. Attempts were made to determine the molecular weights of these substances. The author concludes that the glutin molecule is resolved with assimilation of water into peptone molecules of gradually decreasing molecular weight, till a point is reached at which the peptonization ceases, and the simpler peptones are resolved into amido-acids, lysin, lysatin, etc. As, however, the molecule of the proteids consists of two atom-complexes which present a varying resistance to further hydrolysis, the simpler products of decomposition are always mixed with unaltered peptones.—Ber. d. Chem. Ges., 25, 1202–1236; Jour. Chem. Soc., 1892, 895; Am. Jour. Pharm., 1892, 478–481.

Somatose.—A German firm have placed upon the market a preparation called somatose, which contains 84 to 86 per cent. of albumoses with but traces of peptone, and is devoid of the bitter taste and disagreeable odor of peptone.—Pharm. Centralh.; West. Drug.

Proteids.

Proteids.—Edmund White. The proteids contain the elements combined within the following range usually:

Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Sulphur.
p.c.	p.c.	p.c.	p.c.	p.c.
50–55	6.5–7.5	20–24	15–17	.3–2.4

Classification of Proteids.—The chief points assisting in the distinction and classification of proteids are their solubility or insolubility in (*a*) water, (*b*) saline solutions of various strengths, (*c*) acids and alkalies, and (*d*) the temperature of coagulation.

Class I, Albumins.—Egg albumin; serum albumin; vegetable albumin; albumins also contained in muscle and milk.

Class II, Globulins.—Fibrinogen; vitellin; myosin; serum globulin; vegetable globulins; globin; globulin contained in snake poison.

Class III, Albuminates or Derived Albumins.

Class IV, Albumoses.—Proto-albumose; hetero-albumose; deutero-albumose.

Class V, Peptones.—Hemi-peptone; anti-peptone.

Class VI, Coagulated Proteids.

Constitution of Proteids.—Very little is known about the constitution of poteid molecules, except that they are exceedingly complex and liable to change under comparatively slight external influences. The author gives the theories appertaining thereto.—Pharm. Jour. and Trans., 1892, 450; Am. Jour. Pharm., 1893, 37.

Proteid Hydrochloride.—L. Gillespie states that proteids have a weak affinity for hydrochloric acid, and although the combination is by no means strong, he suggests that the compounds should be called proteid hydrochlorides. If no free hydrochloric acid be present, these bodies strike no scarlet color with Günzberg's vanillin-phloroglucin, with Boas' resorcin, or with Mohr's sulphocyanide reagent. They lose none of their acidity on evaporation to dryness, unlike the free acid. They have, however, the same saturating power as the original hydrochloric acid. The percentages of acid to proteid are as follows: In the case of albumen, 1 to 7.5; acid-albumen, 7.5 to 9; proto-albumose, 11; deutero-albumose, 13, and peptone, 17 to 20. Dr. Gillespie considers that during the process of digestion, when proteids reach the stomach, the hydrochloric acid is

secreted and combines at once with them. Until the albumen molecule combines with at least 7.5 per cent. of acid, it still has the properties of albumen; above that percentage it behaves like acid albumen. This in time splits up into the smaller molecules of proto-albumose, each of which has 11 per cent. HCl attached and so, in like manner, the proto-albumose divides into deutero-albumose, and that into peptone.—Chem. and Drug., 1892, 402.

Proteids—Behavior of, towards Concentrated Hydriodic Acid.—V. Lorenz.—Zeit. Physiol. Chem., xvii, 457.

Proteids of White of Egg.—Ramsden.—Proc. Physiol. Soc., 1892, 23; Jour. Chem. Soc., 1893, 379.

Proteid Precipitate Produced by Potassium Ferrocyanide—Color Reactions of.—H. Winternitz.—Abstract, Jour. Chem. Soc., 1892, 1036.

Waters.

Composition of Water and Gay Lussac's Law of Volumes.—A. Leduc.—Compt. rend., cxv, 41.

Chemical Analysis of Drinking Water.—A critical examination upon the existing methods and results, by C. O. Curtman.—Pharm. Rund., 1893, 130.

Potable Waters—Volumetric Estimation of Suphates.—Vitali applies, in a reversed form, the volumetric process devised by himself for estimating the metals of the alkaline earths, to the determination of dissolved sulphates.—L'Orosi, 1892, 260; Jour. Chem. Soc., 1893, 245.

——— *Volatile Organic Matter in, and Method of Estimating dissolved, fixed and volatile Organic Matter in Water.*—N. C. Young gives a method to determine the total organic matter. 1 liter of water, to which 0.5 Gm. of dried and ignited sodium carbonate is added, is distilled in a conical iron still of about 2 liters capacity, attached to a tin worm-condenser. The distillate is received in a graduated measure, and when 970 C.c. has been collected, the source of heat is removed, the still disconnected, the contents and washings placed in a platinum basin, and evaporated to dryness on a water-bath. The residue is then dissolved in a little pure distilled water, filtered through an asbestos plug into a platinum basin, dried on a water-bath, and subsequently heated for an hour in an air-bath at 150°. After cooling in a desiccator, the basin and contents are weighed. The residue is then ignited at a low temperature, cooled, and weighed, and the loss noted. The ignited residue is dissolved in water, excess of sulphuric acid added, and then standard solution of potassium permanganate (1 C.c. = 0.0001 gram O) until the color remains permanent after five minutes. The weight of oxygen lost, thus ascertained, is deducted from the loss on ignition, and the difference is the organic matter. To determine the fixed organic matter, the same course is followed, except that the sodium carbon-

ate is not added until the concentrated water is transferred from the iron still to a platinum basin. To determine the volatile organic matter, the distillate from the last-mentioned process is placed in the still, together with 0.5 Gm. of sodium carbonate, and distilled until about 25 C.c. remain in the still, afterwards proceeding as before, except that it is unnecessary to ascertain the oxygen lost by ignition. The result presents about two-thirds of the total volatile organic matter present; further small quantities can be recovered from the distillate by repeating the process.—Jour. Soc. Chem. Ind., x, 883; Jour. Chem. Soc., 1892, 921.

Water—Gravimetric Composition of.—W. Dittmar.—Chem. News, 1893, 54, etc.

The Value of a Water Analysis.—W. P. Mason.—Science, 1893, 258.

Water Analysis a Failure.—Editorial upon the results of analyses by G. Buchanan and J. C. Thresh, showing the necessity of studying the source of supply.—Chem. and Drug., 1892, 518, 563, 595; 1893, 28.

Water Analysis.—J. A. Wanklyn reviews the objections to the Frankland water analysis.—Chem. News, 1892, 102, 111.

Is Water Analysis a Failure?—Lecture by G. D. Macdougald.—Chem. and Drug., 1892, 674.

The Action of Water upon Glass.—F. Mylius and F. Forrester (Zeitschr. f. anal. Chem.; Chem. News, 1892, 73). The authors summarize their rough researches in the following propositions, which they consider proved by their own observations and those of Pfeiffer and Kohlrausch:

(1) The solution of glass in water depends on a decomposition in which, in the first place, free alkali appears.

(2) The silica of the glass is secondarily dissolved by the free alkali.

(3) The constituents of the solution vary according to the conditions of digestion.

(4) The quantity of alkali which passes into solution from a given surface under given conditions is a measure for the attackability of the glass under these conditions.

(5) The attackability of surfaces of glass by cold water decreases at first very rapidly with the duration of digestion, and subsequently approaches constant values.

(6) Different sorts of glass display a different persistence of the solution. (By this term Kohlrausch characterizes the relation of its solubility after a prolonged digestion to its original solubility.)

(7) The attackability of glass increases very rapidly with a rising temperature.

(8) The relation of the attackabilities of different kinds of glass depends on temperature.

(9) From glasses of equal attackability unequal weights may pass into solution.

(10) The attack ability of good glass is decidedly decreased by a previous treatment with water.

(11) The worse a glass, the less its attackability is diminished by treatment with water.

(12) The attackability of glass surfaces is modified by "weathering."

(13) After treatment with water, surfaces of glass have the property of taking up alkali from the solutions which have been formed, and of giving it up again on renewed treatment with water.

(14) Potash glasses are much more soluble than soda-glasses, but the differences disappear in proportion as the glass is richer in lime.

(15) In the substance of glass vessels, which are not readily attacked by cold and hot water, the lime, alkalies and silica must bear a certain proportion to each other.

(16) Among the best known glasses plumbiferous flint glass is least soluble in water, but it is corroded at its surface and easily decomposed by acids.

Ammonia in Rain Water and the Atmosphere.—Muntz upholds his previous deductions.—Compt. rend., cxiv, 184.

Purification of Water by Chemical Treatment.—W. G. Tucker.—Albany Med. Annals, April, 1892; Science, 1892, 34.

Purification of Water by Repose.—F. L. James.—Nat. Drug., 1892, 140.

Purification of Water by Metallic Iron.—The water of the Grande-Nethe, at Antwerp, has been purified during the past six years, by means of Anderson's process, which is described as follows (Chem. Zeit.): The water passes, with moderate rapidity, through long cylinders which are kept in rotary motion and filled with iron filings. An abundant supply of air is carried into the cylinders by a series of pipes with which they are connected. The iron, whose surfaces are constantly renewed by the motion of the cylinders, is partially changed through the action of the water into ferrous carbonate; the air decomposes the latter into carbonic acid and ferrous hydrate, which is again transformed into ferric hydrate. At the same time the organic substances are consumed, or withdrawn along with the ferric hydrate deposit, which is easily collected by a filter of sand. In this way the water has been shown by analysis to be so far purified of its micro-organisms, that it may be regarded as almost sterilized. The water of the Mississippi, which holds in suspension a very large amount of foreign matter, and does not clarify by standing, parts with seven-eighths of its organic substances when treated as above, and becomes almost limpid.—Drug. Circ., 1892, 22.

Sand-Filters—Experimental Conclusions on the Use of.—Chem. Zeit.; Abstract, Chem. News, 1893, 157.

Water-Filter—A Sample.—Illustration in Chem. and Drug., 1892, 183.

Filtered and Sterilized Water—Remarks on.—W. Glenn describes and illustrates a primitive and cheap filtering apparatus. The filtering material is white sand mixed with small cinders screened out of the ashes of the kitchen range, which burns anthracite. The bits of coke are between ⅛ and ⅜ inch in diameter. There are about five measures of sand to one of coke; about a gallon of the mixture is contained in the filter.—Pharm. Review, 1893, 24.

Sterilization of Water.—A. and Y. Babés adopt a similar plan to that by which suspended minute particles in water are precipitated. The specimen to be purified is shaken with powdered alum and then left at rest for 24 hours. After that time the water is perfectly clear and almost completely sterilized. Freshly prepared sulphate of calcium, oxide of iron, and sulphate of iron are also fairly effective in producing the same results. —Phar. Jour. and Trans., 1892, 264.

Acid Aërated Water.—Dr. E. Jacobsen suggests that, as alkaline media favor the growth of the comma bacillus, aërated beverages should be made acid at the time of a cholera epidemic. He recommends a carbonated water containing hydrochloric or citric acid in the place of alkaline carbonates. In Berlin aërated water is prepared in this way, containing in the pint 4 grains of hydrochloric acid or 8 grains of citric acid. With the same object a highly astringent red wine has been made a medium for administration of citric acid.—Apoth. Zeit., vii, 459.

Color Standard for Waters.—Hazen (Am. Chem. Jour., xiv, 300), proposes to make a standard solution containing 1.246 Gm. K_2PtCl_6 (= 0.5 Gm. Pt), 1 Gm. crystallized $CoCl_2$ (= 0.25 Gm. Cu), and 100 C.c. conc. HCl per liter. 1, 2, 3, etc., C.c. of this stock solution are diluted to 50 C.c. in Nessler cylinders, corresponding to 0.1, 0.2, 0.3, etc., degrees of standard color.

Schäffer's Nitrite Reaction—Investigation of potable water by.—Van DeVenter and Jürgens.—Ber. d. Chem. Ges., xxvi, 932.

Hardness of Water.—A. Partheil, in Pharm. Centralh., 1892, 525, for the determination of the hardness of water. Also see Pharm. Centralh., 1892, 558.

——— Estimation with soap solution by G. Büchner in Chem. Zeit., 1892, 1954. The determination of hardness in waters by means of standard soap solutions must be carried out at a temperature of 15° C., if reliable results are to be obtained; higher temperatures notably decrease the persistency of the lather, even with an excess of soap solution.

Mineral Waters—Preservation of.—P. Parmentier. Mineral waters containing carbonic anhydride, if they contain iron salts also, can only be preserved unchanged by collecting them in vessels previously filled with pure carbonic anhydride. It is essential that no trace of air should remain in the collecting vessels, and that the water should not come in con-

tact with the air while the vessels are being filled.—Compt. rend., cxiv, 1363; Jour. Chem. Soc., 1892, 1162.

Mineral Waters.—Points in the manufacture, by W. Zinkeisen.—Chem. and Drug., 1893, 475.

Medicinal Waters.—A full account of the history connected with these waters and the places where they are found. Heger.—Pharm. Post, 1892, 769.

Mineral Waters—Aluminum in.—Parmentier gives the quantity in various springs.—Compt. rend., cxv, 125.

Mineral Water of "Monte di Malo."—Spica gives composition.—Abstract, Jour. Chem. Soc., 1892, 1287.

Mineral Waters—Alteration of Chalybeate.—J. Riban.—Compt. rend., cxiv, 1483.

——— Chalybeate.—Parmentier.—Ibid., cxv, 53.

——— Riban.—Ibid., 185.

Mineral Waters of Askern, in Yorkshire.—C. H. Bothamley records analyses made at different times of the year.—Jour. Chem. Soc., 1893, 685.

Hunyadi Janos Water.—Analysis by J. W. Biggart.—Chem. and Drug., 1892, 56.

Hepatic Mineral Water and Mud of the Valle del Gallo.—Agrestini.—Gaz., xxii, 287; Jour. Chem. Soc., 1893, 175.

Iron in Spring Water—Estimation of.—Gerhard proposes the use of tannin (from galls) as a colorimetric reagent; by its use $\frac{1}{15}$ milligram of iron per liter can be detected.—Arch. der Pharm., 230, 705.

Mineral Waters of Japan.—Michaut (Bull. de Thérapeut., 1892, i, 549, and ii, 27), publishes analyses of a number of mineral waters of Japan:

Atami: Sodium chloride, 3.790; magnesium chloride, 2.333; potassium chloride, 1.810; calcium chloride, 1.767; calcium sulphate, 0.190; calcium bicarbonate, 0.004; ferrous carbonate, 0.003; silica, 0.003; bromides, 0.110; manganese, trace; total, 10.007 Gm. in 1 litre water.

Ashinoyou: Sulphuric acid, 0.3760; calcium carbonate, 0.0423; potassium silicate, 0.1390; magnesia, 0.0324; phosphates, traces; alumina, 0.0430; chlorides, traces; sodium carbonate, 0.0243; organic matter, traces; potash, 0.0109: oxide of iron, traces; total, 0.662 Gm. to 1 liter. Besides the above this spring contains also considerable sulphuretted hydrogen.

Arima: Sodium chloride, 14.717; potassium chloride, 1.281; calcium chloride, 2.896; magnesium chloride, 0.241; aluminum chloride, 0.029; lithium chloride, traces; ferric carbonate, 0.246; manganese oxide, 0.055; calcium sulphate, 0.014; silica, 0.058; undetermined salts, 0.118; organic matter, traces; total, 16.655 Gm. to 1 liter.—Am. Jour. Pharm., 1892, 518.

Lime Water, Aërated.—S. R. Powell's examination of seven commercial specimens. They contained respectively of CaO in 10 fl. oz. 1.4; 0.98; 2.15; 4.2; 2.84; 3.00; and 2.1 grs.—Chem. and Drug., 1893, 113.

Niagara River Water.—E. Gudeman reports that the water taken from the Niagara river, which up to August last gave an absolutely neutral reaction, suddenly became alkaline. When distilled, however, a distinct acid reaction is given by it, even when caustic soda, sodium carbonate, caustic baryta and barium carbonate are added, previous to distillation. Permanganate of potassium gives no better result, and filtration through animal charcoal has no effect on the acidity of the subsequent distillate. The kind of vessel employed and method of applying heat make no difference. Since the water remaining in the retort remains alkaline, the acid is evidently a decomposition product. The distilled water leaves no residue on evaporation, and can be purified from the acid body by boiling off one-fourth of its bulk, when the remainder is left neutral. It has been proved that there is no local contamination of the river, and the investigation is proceeding.—Jour. Amer. Chem. Soc., xiv, 221.

Distribution of Acids and Bases in a Solution containing Calcium, Magnesium, Carbonic Acid and Sulphuric Acid, and on the Composition of Mineral Waters.—C. H. Bothamley.—Jour. Chem. Soc., 1893, 696.

Spring Water—Viscosity in.—By J. H. Stebbins. A sample of "sweet spring water," possessing a viscosity suggestive of glycerin and due to organic matter. Microscopic examination when water was evaporated revealed rod-shaped bacillus-like bodies.—Jour. Am. Chem. Soc., xiv, 4, 115; Phar. Jour. and Trans., 1892, 83.

Salt Brines—Constituents of.—J. and S. Wiernik.—Zeitsch. f. angew. Chem., 1893, 43.

Water from the Black Sea—Saline Constituents of.—Kolotoff.—Abstract, Jour. Chem. Soc., 1893, 326.

Sea Water—Composition of.—F. Gibson.—Chem. News, 1892, 151.

Zinc-bearing Spring Waters from Missouri.—W. F. Hillebrand.—Amer. Jour. Sci., 43, 418.

MISCELLANEOUS.

Chemistry—Agricultural.—By Pres. Caldwell of American Chemical Society. The more notable events in the progress in Agricultural Chemistry since 1870.—Pharm. Jour. and Trans., 1892, 95–100; 134–138.

Bleaching and Bleaching Agents.—C. Dreberg.—A lecture from Tropical Agric.; Pharm. Era, 1893, 245–247.

Utilization of Molasses.—Pharm. Jour. Trans., 1893, 605; Pharm. Centralb., 23, 719.

Resins.—Contribution by A. H. Church to Chemistry of Paints and Painting.—Pharm. Era, 1892, 230.

OBITUARY.

William Ainslie, born, 1822; died, Edinburgh, Nov. 30, 1892.

Peter Wendover Bedford, born, August 1, 1836; died, July 20, 1892.

C. E. Billings, born, 1834; died, Newton, Mass., Oct. 19, 1892.

William B. Blanding, ex-Vice-President of the A. P. A.; died, May 3, 1892.

Ernst Boehringer, born, 1860; died, Chiavenna, Italy, Sept. 15, 1892.

Frederick Bozon, born, 1830; died, Woolahara, New South Wales, Oct. 13, 1892.

Rudolph John Christian Brunnengraeber, an honorary member of the American Pharmaceutical Association; born, May 19, 1832; died at Rostock, Germany, Feb. 19, 1893.

Henry H. Burgess, born, May, 1833; died, Portland, Maine, Feb. 12, 1893.

Julius Cyriax, a London druggist, born, 1839; died, Sweden, Sept. 28, 1892.

Alphonse Louis Pierre Pyrame De Candolle, born, Oct. 28, 1806; died, Geneva, Switzerland, April 5, 1893.

Dundas Dick, born, April, 1838; died, New York, April 1, 1893.

Wm. Dymock, died at his residence, Malabar Hill, Bombay, April 30, 1892.

D. S. Dyson, born, Nov. 27, 1832; died, Bloomington, Ill., Feb. 15, 1893.

Henry Weld Fuller, born, April 7, 1831; died, Chicago, June 28, 1892.

Samuel Gale, born, Oct. 8, 1826; died, London, March 28, 1893.

Frederick A. Genth, born, 1820; died, Philadelphia, Pa., Feb. 3, 1893.

John F. Henry, born, Feb. 24, 1834; died, Brooklyn, May 25, 1893.

William Henry Kernot, born, 1829; died, Geelong, Dec. 21, 1892.

John M. Maisch, Permanent Secretary of the American Pharmaceutical Association, born Jan. 30, 1831; died in Philadelphia, Sept. 10, 1893.

Brink Morris, born, Feb. 17, 1851; died, Redlands, Cal., June 18, 1892.

Valerian Ossipowitch Podwissotzky, born in 1822; died at Kasan, Russia, June 28, 1892.

Carl Prantl, born, Sept. 10, 1849; died, Breslau, Feb. 24, 1893.

James Richardson, born, July 14, 1817; died, St. Louis, March 1, 1893.

Frederick Robinson, born, 1824; died, Racine, Wis., April 11, 1893.

E. Walton Russell, born, 1831; died, Baltimore, Oct. 5, 1892.

George Webb Sanford, died, May 16, 1892, at Cromer.

Eugene Schaedelin, born, 1803; died, Paris, 1893.

Carl Schorlemmer, born, Sept. 30, 1834; died, Manchester, England, June 27, 1892.

Charles A. Seeley, born, Nov. 27, 1825; died, Mt. Vernon, N. Y., Nov. 4, 1892.

Alanson Sheley, born, 1808; died, Detroit, Nov. 7, 1892.

J. Léon Soubeiran, born, Nov. 27, 1827; died, Dec. 15, 1892.

Henry Stiles, born, 1825; died, North Fitzroy, May 27, 1892.

John Jacob Thomsen, born, May 23, 1823; died, Baltimore, Nov. 22, 1892.

George Vasey, born, Feb. 28, 1822; died in Washington, D. C., March 4, 1893.

D. Vogt, born, 1845; died, Charleston, S. C., Nov. 2, 1892.

Jacob D. Wells, born, June 22, 1835; died, Feb. 17, 1893.

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APPENDIX.

THE ASHEVILLE MEETING.

The next meeting of the American Pharmaceutical Association will be held in the beautiful mountain district of North Carolina, in the city of Asheville. This section has long been an attractive one to the pharmacists of the United States. Large numbers of medicinal plants are gathered in this vicinity, and the beautiful scenery along the French Broad has been celebrated in prose and verse.

The accommodations at the Battery Park Hotel are excellent. Railroad facilities are now very good, first-class trains running to and from Asheville.

There is every prospect of a most successful meeting of the Association in September. Whilst the Local Committee have not yet definitely arranged their programme, the following will in all probability be accepted in its main features.

PROPOSED PROGRAMME FOR THE NEXT ANNUAL MEETING AT ASHEVILLE, N. C.

Monday, September 3,	10 a. m.	Council meeting.
	3 p. m.	First general session.
	8:30 p. m.	Reception.
Tuesday, September 4,	9 a. m.	Second general session.
	3 p. m.	Section on Commercial Interests.
	8 p. m.	Section on Commercial Interests.
Wednesday, September 5,	9 a. m.	Section on Scientific Papers.
	3 p. m.	Section on Scientific Papers or entertainment.
	8 p. m.	Section on Scientific Papers.
Thursday, September 6,	9 a. m.	Section on Education and Legislation.
	3 p. m.	Section on Education and Legislation.
Friday, September 7,	9 a. m.	Final session of the Association.
	3 p. m.	Entertainment.

LIST OF COLLEGES AND ASSOCIATIONS

HAVING ACCREDITED DELEGATES TO THE FORTY-FIRST ANNUAL MEETING, WITH THE ADDRESSES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

Colleges.	*Presidents.*	*Secretaries.*
Brooklyn	A. H. Brundage	F. N. Bliss.
Chicago	Emil Thiele	E. K. McPherson.
Cincinnati	Albert Witterstroem	A. W. Bain.
Illinois (Chicago)	D. R. Dyche	T. H. Patterson.
Louisville	J. W. Fowler	Fred. C. Miller.
Maryland (Baltimore)	Louis Dohme	John W. Geiger.
Massachusetts (Boston)	Wm. F. Sawyer	C. C. Williams.
National (Washington, D. C.)	F. M. Criswell	H. E. Kalusowski.
Ontario	John J. Hall	Isaac T. Lewis.
Philadelphia	Chas. Bullock	W. B. Thompson.
St. Louis	Henry Braun	J. C. Falk.

STATE PHARMACEUTICAL ASSOCIATION.

	Presidents.	*Secretaries.*
Alabama	E. P. Galt, Selma	P. C. Candidus, Mobile.
Arkansas	G. N. Hart, Pine Bluff	J. W. Beidelman, Little Rock.
California	C. E. Worden, San Francisco	G. J. Harvey, San Francisco.
Colorado	Judson Turrel, Longmont	F. A. Lyneman, Denver.
Connecticut	Willis L. Mix, New Haven	Frederick Wilcox, Waterbury.
Delaware	N. B. Danforth, Wilmington	John H. Harvey, Wilmington.
Florida	T. S. Chalker, Lake City	W. H. Lighthouse, Jacksonville.
Georgia	E. M. Wheat, Columbus	H. H. Arrington, Summerville.
Illinois	A. Lee Hatch, Jacksonville	Frank Fleury, Springfield.
Indiana	John Kennedy, Vincennes	W. H. Stocker, Indianapolis.
Iowa	T. W. Ruete, Dubuque	Rosa Upson, Marshalltown.
Kansas	T. W. Atkins, Girard	Mary O. Miner, Hiawatha.
Kentucky	R. J. Snyder, Louisville	J. W. Gayle, Frankfort.
Louisiana	P. A. Capdau, New Orleans	Mrs. E. Rudolf, New Orleans.
Massachusetts	Henry M. Whitney, Lawrence	Miner L. H. Leavitt, Boston.
Michigan	Stanley E. Parkhill, Owosso	Chas. W. Parsons, Detroit.
Minnesota	C. R. J. Kellam, Heron Lake	Chas. T. Heller, St. Paul.
Missouri	W. Mittelbach, Booneville	H. M. Whelpley, St. Louis.
New Hampshire	A. S. Wetherell, Exeter	F. L. Way, Manchester.

New Jersey	E. B. Jones, Mt. Holly	Wm. C. Alpers, Bayonne.
New York	Charles O. Rano, Buffalo	Clay W. Holmes, Elmira.
North Carolina	Henry R. Chears, Plymouth	F. W. Hancock, Oxford.
Ohio	G. L. Hechler, Cleveland	Lewis C. Hopp, Cleveland.
Pennsylvania	Wm. McIntyre, Philadelphia	J. A. Miller, Harrisburg.
Rhode Island	E. W. Vars, Niantic	Wm. E. Cates, Providence.
South Dakota	R. M. Cotton, Tyndall	I. A. Keith, Lake Preston.
Tennessee	J. O. Burge, Nashville	W. Vickers, Murfreesboro.
Texas	L. Myers Connor, Dallas	Geo. W. Heyer.
Utah	S. P. Ash, Ogden	Clarence H. McCoy, Salt Lake.
Virginia	F. M. Wills, Charlottesville	C. B. Fleet, Lynchburg.
Washington	A. W. Doland, Spokane	Walter St. John, Tacoma.
Wisconsin	Henry Rollman, Chilton	E. B. Heimstreet, Janesville.
Quebec (Can)	Joseph Contant, Montreal	E. Muir, Montreal.

COUNTY AND CITY ASSOCIATIONS.

	Presidents.	*Secretaries.*
Cleveland	Henry Bechberger	Carl Krebs.
Kings Co. (N. Y)	A. H. Brundage, Brooklyn	F. N. Bliss, Brooklyn.

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

	Presidents.	*Secretaries.*
California	Emory P. Gates	Otto A. Weihe.
Chicago	James A. Lydston	Charles C. Thiel.
Cincinnati	Theo. D. Wetterstroem	Rudolph Fack.
Louisville	Albert Muench, M. D.	Wm. G. Zubrod.
Maryland	Henry P. Hynson	Harry C. Hyde.
Massachusetts	J. Allen Tailby	W. L. Scoville.
National	B. O. Tayloe	A. T. Bronaugh.
New York	Herman Graeser	J. C. Nielsen.
Philadelphia	David H. Ross	Wm. E. Krewson.
St. Louis	J. C. Falk	Harry Stark.
Tulane Univ. Pharmacy Dept	Edward Wunderlich	G. de Mousabert.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

Frank A. Faxon, *President.* A. B. Merriam, *Secretary.*

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

Michael Carteighe, *President.* Richard Bremridge, *Secretary.*

AMERICAN MEDICAL ASSOCIATION.

Hunter McGuire, M. D., *President.* W. B. Atkinson, M. D., *Permanent Secretary.*

LIST OF MEMBERS IN ATTENDANCE AT CHICAGO.

Names of delegates indicated by *; delegates not members by *†.

Acker, Philip, Cleveland, O.
* Alfreds, H. J., Providence, R. I.
* Alpers, Wm. C., Bayonne, N. J.
Andrews, J. H., Seymour, Ind.
August, Ely S., Chicago, Ill.
Austin, Stella, Woodstock, Ill.
* Averill, W. H., Frankfort, Ky.
Bartley, E. H., Brooklyn, N. Y.
Baur, Jacob, Terre Haute, Ind.
Behrens, Paul J., Chicago, Ill.
Bell, John I., Chicago, Ill.
Bell, S. Howard, Derry Depot, N. H.
Bishop, S. E., Chicago, Ill.
Blakeley, George., The Dalles, Ore.
Bocking, Edmund, Wheeling, W. Va.
Borell, Henry A., Philadelphia.
Bowron, W. H., Caldwell, O.
Boyd, W. P., Arcola, Ill.
Braunwarth, Alice L., Muscatine, Ia.
* Breslin, M. T., New Orleans, La.
* Burge, J. O., Nashville, Tenn.
* Butler, F. H., Lowell, Mass.
*† Butts, W. J., Brunswick, Ga.
* Candidus, P. C., Mobile, Ala.
Carter, Frank H., Indianapolis, Ind.
* Caspari, Chas. Jr., Baltimore, Md.
Chears, Henry R., Plymouth, N. C.
Christie, Jos., New York, N. Y.
* Church, M. E., Falls Church, Pa.
Coffey, J. N., Cairo, Ill.
Conrad, John, Chicago, Ill.
* Conrath, Adam, Milwaukee, Wis.
* Constantine, E. R., Louisville, Ky,
Cook, Thos. P., Philadelphia, Pa.
* Cornell, R. W., Darien, Ga.
Crissey, Julia M., Omaha, Neb.
*† Cunningham, Mrs. H. M., Houston, Tex.
* Curtmann, Chas. O., St. Louis, Mo.
* Dadd, John A., Milwaukee, Wis.
Davis, Samuel C., Norton, Ill.
Delano, Thos. J., Jr., Boston, Mass.
* Dewoody, W. L., Pine Bluff, Ark.
Diehl, Chas., Cincinnati, O.
Diehl, C. Lewis, Louisville, Ky.
*† Dimmitt, Addison, Louisville, Ky.
Doerschuk, A. N., Kansas City, Mo.
* Dohme, Charles E., Baltimore, Md.
Doliber, Thomas, Boston, Mass.
* Druehl, F. A., Salt Lake City, Utah.
Dumbeck, W. H. Chicago, Ill.
Dunn, John A., Brooklyn, N. Y.
Dunwody, R. G., Atlanta, Ga.
* Easterday, H. C., Washington, D. C.
Eaton, J. M., Chicago, Ill.
* Ebert, Albert E., Chicago, Ill.
* Eccles, R. G., Brooklyn, N. Y.
* Eger, Geo., Cincinnati, O.
Eggers, Dr. Leo., Vienna, Austria.
Eichrodt, Charles W., Indianapolis, Ind.
*† Eisele, M. A., Hot Springs, Ark.
Eliel, Leo, So. Bend, Ind.
Emerson, H. L., Boston, Mass.
Farnsworth, L.
Feil, Joseph, Cleveland, O.
* Fennel, Chas. T. P., Cincinnati, O.
* Fenner, A. W., Providence, R. I.
* Finlay, A. K., New Orleans, La.
* Firmin, John C., Findlay, O.
Fleischer, A. T., Chicago, Ill.
Fleury, Frank, Springfield, Ill.
Flood, W. H., Cleveland, O.
Folkes, H. M., Jackson, Miss.
*Ford, Chas. M., Denver, Colo.
Ford, H. L., New York City.
Fowler, J. W., Louisville, Ky.
Frerksen, Richard G., Chicago, Ill.
*† Fry, Herman, Chicago, Ill.
Furher, J. W., Bloomington, Ill.
Garthhofner, Frank C., St. Louis, Mo.
Geiger, Chas. F., St. Louis, Mo.
Gerard, C. G., Detroit, Mich.
Godbold, F. C., New Orleans, La.
* Good, J. M., St. Louis, Mo.
Goodman, C. F., Omaha, Neb.

*† Gordon, Jean, Miss, Chicago, Ill.
Gordon, W. J. M., Cincinnati, O.
Grassly, C. W., Chicago, Ill.
Greve, T. L. A., Cincinnati, O.
* Greyer, Julius, Cincinnati, O.
Grimm, Henry P., Aurora, Ill.
Gundrum, Geo., Ionia, Mich.
*† Hall, John J., Woodstock, Ontario.
Hallberg, C. S. N., Chicago, Ill.
Hamilton, Claude, Kansas City, Mo.
* Harris, C. C., Tampa, Fla.
Harter, J. F., Stronghurst, Ill.
Hartwig, Chas. F., Chicago, Ill.
Hartwig, O. M. J., Chicago, Ill.
Hassebrock, Henry F., St. Louis, Mo.
Hassinger, S. E. R., Philadelphia, Pa.
Hatch, H. Lee.
* Hattenhauer, R. C., La Salle, Ill.
Hechler, G. L., Cleveland, Ohio.
E. B. Heimstreet, Janesville, Wis.
* Heinitsh, Charles A., Lancaster, Pa.
Henniter, Dr. John.
Henry, C. L., New York, N. Y.
Herbst, F. W., Columbus, O.
Hereth, Frank S., Chicago, Ill.
Hilgenberg, Chas.
* Hilton, Saml. L., Washington, D. C.
Hodges, J. Walter, Washington, D. C.
Hoffman, Fr., New York, N. Y.
Hogan, L. C., Chicago, Ill.
* Holzhauer, Charles, Newark, N. J.
* Hurty, J. N., Indianapolis, Ind.
Hynson, Henry P., Baltimore, Md.
Ink, Chas. E., Columbiana, O.
Irvin, W. A., El Paso, Texas.
James, Frank L., St. Louis, Mo.
Jamieson, T. N., Chicago, Ill.
* Jesson, Jacob, Muskegon, Mich.
* Jones, Edw. C., Media, Pa.
Jones, James H., New York, N. Y.
Kaliski, Sam'l, Chicago, Ill.
Kelter, J. B., Chicago, Ill.
* Kennedy, Geo. W., Pottsville, Pa.
Knudsen, Rudolph, Chicago, Ill.
Koch, Gustavus, St. Louis, Mo.
Koch, Mrs. G., St. Louis, Mo.
Kaster, John, Chicago, Ill.
Kraemer, Henry, New York City, N. Y.
Krehe, J. Theo., Muscatine, Ia.
* Kremers, Edward, Madison, Wis.
* Lachance, S., Montreal, Can.
Lammert, C. J., Cincinnati, O.
Lannin, Theo. F., Chicago, Ill.
Last, Louis, Moberly, Mo.
Lawrence, T. F., Chicago, Ill.
* Legendre, J. A., New Orleans, La.
Lehr, P., Cleveland, O.
* Lemberger, Jos. L., Lebanon, Pa.
Lillard, Benj., New York, N. Y.
* Lloyd, J. U., Cincinnati, O.
Loehr, Theo. C., Carlinsville, Ill.
Loomis, Jno. C., Jeffersonville, Ind.
Lord, F. J., Denver, Colo.
Major, A., New York, N. Y.
Manning, John H., Pittsfield, Mass.
Marrow, C. J.
Marshall, R. P., Philadelphia, Pa.
Martin, H. N., New Castle-on-Tyne, Eng.
Martin, Hugo W. C., Chicago, Ill.
* Martinez, R. J., Jacksonville, Fla.
Masholder, J. H., Philadelphia, Pa.
Matthews, Chas. E., Chicago, Ill.
Mayer, Chas. S., Louisville, Ky.
Maynard, Z. T., Chicago, Ill.
McAfee, J. J., Mobile, Ala.
McIntyre, William, Philadelphia, Pa.
Means, J. C., Natchez, Miss.
* Meininger, A. Cincinnati, O.
* Meissner, F. W., Jr., La Porte, Ind.
Meissner, Paul E., Milwaukee, Wis.
* Merrell, Chas. G., Cincinnati, O.
* Metz, A. L., New Orleans, La.
* Miner, Mrs. M. O., Hiawatha, Kans.
Mittelbach, Wm., Boonville, Mo.
Molwitz, Ernest, New York, N. Y.
Moore, John T., Lawrence, Kan.
* Morrison, J. E., Montreal, Can.
Muench, Albert, Louisville, Ky.
*† Muir, E., Montreal, Can.
Mulford, H. K., Philadelphia, Pa.
Myers, John, Chicago, Ill.
Nattans, Arthur, Washington, D. C.
Oberman, A., Chicago, Ill.
Odena, Fred. M., Detroit, Mich.
* Oldberg, Oscar, Chicago, Ill.
* Overstreet, W. P., Louisville, Ky.
*† Pamphilon, F. H., Brooklyn, N. Y.
* Patch, Edgar L., Boston, Mass.
Patterson, T. H., Chicago, Ill.
Patton, John F., York, Pa.
Payne, Geo. F., Atlanta, Ga.
* Peniston, Paul, Palmetto, Ga.
Pettit, H. M., Carrolton, Mo.
Peyton, R. D., Louisville, Ky.

* Pfeiffer, John, Brooklyn, N. Y.
* Pickett, John H., Oskaloosa, Ia.
Pierce, Howard A., Providence, R. I.
Pike, Samuel, Chicago, Ill.
Plummer, D. G., Bradford, Ill.
Prais, Howard, Lawrence, Kans.
Preston, A. P., Portsmouth, N. H.
Price, Chas. H., Salem, Mass.
Reed, James, Chicago, Ill.
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Rhode, R. E., Chicago, Ill.
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Robinson, E. A., Lowell, Mass.
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Sawyer, W. W., Rockford, Ill.
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Schoettlin, Albert J., Louisville, Ky.
* Schafer, Geo. H., Fort Madison, Ia.
Schaffer, F. C., Chicago, Ill.
Schenke, Louis, St. Louis, Mo.
Scherer, Andrew, Chicago, Ill.
Schimpf, Henry W., Brooklyn, N. Y.
Schmidt, Fred. M., Chicago, Ill.
Schneller, Fred. W., Columbus, O.
* Schoettlin, Albert J., Louisville, Ky.
Schranck, Henry C., Milwaukee, Wis.
*† Schuh, Paul, Cairo, Ill.
Schurk, Louis, St. Louis, Mo.
Schwab, L. W., Chicago, Ill.
Scott, Jos. McDonald, Chicago, Ill.
Scott, Wm. H., Richmond, Va.
Seabury, George J., New York, N. Y.
Sears, Henry R. C., Chicago, Ill.
Sharples, S. P., Boston, Mass.
*† Shendal, Ernest E., Hot Springs, Ark.
* Sheppard, S. A. D., Boston, Mass.
Sherrard, C. C., Detroit, Mich.
* Simon, W., Baltimore, Md.
* Simpson, Wm., Raleigh, N. C.
Slack, Henry R., La Grange, Ga.
* Sloan, Geo. W., Indianapolis, Ind.
Sohrbeck, G. H., Moline, Ill.
Spengler, J. G., Dayton, O.
*† Spilker, H. F. A., St. Louis, Mo.
Spilker, Mrs. L. H., St. Louis, Mo.
* Stacey, B. F., Charlestown, Mass.
Stangohr, R., Chicago, Ill.
Staudt, Louis C., Aurora, Ill.
Stedem, F. W. E., Philadelphia, Pa.
* Stein, Jacob H., Reading, Pa.
Stevens, Luther F., Brooklyn, N. Y.
Stevens, A. B., Ann Arbor, Mich.
Stork, Harry, St. Louis, Mo.
Stoff, Louis, New York, N. Y.
Taylor, Walter T., New Orleans, La.
* Thompson, W. S., Washington, D. C.
* Tigner, J. O., Greenville, Ga.
* Torbert, W. H , Dubuque, Ia.
Travis, M. B., Saybrook, Ill.
Treat, J. A., Stuart, Ia.
* Trimble, Henry, Philadelphia, Pa.
* Troppman, Chas. M., San Francisco, Cal.
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Turrell. J. W., Longmont, Colo.
Uhlich, F. G., St. Louis, Mo.
Upson, Dr. Rosa, Marshalltown, Ia.
Vander, Hyden J., Amsterdam, Holland.
Vernor, James, Detroit, Mich.
Voigt, J. F., Chattanooga, Tenn.
Von Hermann, E., Chicago, Ill.
Vordick, August H., St. Louis, Mo.
Voss, G. W., Cleveland, O.
Wagner, Henry, Cincinnati, O.
Walker, J. P., Montezuma, Ga.
Warner, Wm. R., Philadelphia, Pa.
Watson, S. P., Atlanta, Ga.
Weinman, Oscar C., New York, N. Y.
Wellcome, Henry S., London, Eng.
Wendel, H. Edward, Philadelphia, Pa.
Wetterstroem, Albert, Cincinnati, O.
Wheat, E. M., Columbus, Ga.
Wheaton, Charles, Chicago, Ill.
* Whelpley, H. M., St. Louis, Mo.
Whitfield, Thos., Chicago, Ill.
* Whitney, H. M., Lawrence, Mass.
Willett, G. Howard, Kansas City, Mo.
Wolters, Albert, Chicago, Ill.
Woltersdorf, L., Chicago, Ill.
* Woodman, W. J., St. Augustine, Fla.
Yeomans, L. W., Belleville, Ontario.
Zahn, Emil A., Chicago, Ill.
Zimmerman, C., Peoria, Ill.
Zwick, G. A., Covington, Ky.

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Delegates becoming Members:

Cornell, Russel W., Darien, Ga.
Easterday, Herbert C., Washington, D. C.
Firmin, John C., Findlay, Ohio.
Martinez, R. J., Jacksonville, Fla.
Overstreet, W. P., Louisville, Ky.
Peniston, Paul, Palmetto, Ga.
Pfeiffer, John, Brooklyn, N. Y.
Troppman, Chas. M., San Francisco, Cal.
Woodman, W. I., St. Augustine, Fla.

Members by Proposition and Election:

Anderson, James M., Pine Bluff, Ark.
Apple, Franklin M., Philadelphia, Pa.
Argenti, Jerome J. B., San Francisco, Cal.
Auf'mwasser, Julius H., Covington, Ky.
Bartlett, John A., Cleveland, Ohio.
Bartley, Elias H., Brooklyn, N. Y.
Bechberger, Henry, Cleveland, O.
Behrens, Emil C. L., Chicago, Ill.
Benfield, Charles W., Cleveland, O.
Beringer, George M., Camden, N. J.
Blackman, Augustus S., New York City.
Boyden, Henry D., Louisville, Ky.
Brewer, John W., Lake Preston, S. Dak.
Bronson, George S., Chicago, Ill.
Brown, W. A., Winnemucca, Nev.
Buchheit, Aug. W., Grand Island, Neb.
Carriere, Rodrigue, Montreal, Can.
Cartledge, Edward C., Atlanta, Ga.
Chears, Henry R., Plymouth, N. C.
Christie, James, New York.
Cotton, R. M., Tyndall, S. Dak.
Crosby, Charles M., Marietta, Ga.
Cuthbert, Richard W., Philadelphia, Pa.
Davis, Samuel C., Morton, Ill.
De Armona. Joseph R., Key West, Fla.
Donaldson, Joseph C., Minneapolis, Minn.
Egeling, B. F. Gustavus, Alameda, Cal.
Elliott, Sidney T., Cleveland, O.
England, Joseph W., Philadelphia, Pa.
Ewing, John, Jersey City, N. J.
Feldkamp, Charles L., Chicago, Ill.
Ferguson, Andrew D., Regina, N. W. T.
Fieber, Gustavus A., Cincinnati, O.
Fisher, George W., DeLand, Fla.
Fouqué, Joseph, Fort Bowie, Ariz. Ty.
Gallagher, John C., Jersey City, N. J.
Gee, Charlie, Emory, Texas.
Gidday, Frederic C., Detroit, Mich.
Gleim, John C., Cleveland, O.
Grossman, Edward L., San Francisco, Cal.
Haak, William H., Cleveland, O.
Hall, Nettie C., Wessington Springs, S. Dak.
Hamilton, Claude C., Kansas City, Mo.
Hannan, Owen B., Cleveland, O.
Harris, William S., Tampa, Fla.
Hart, Gilbreath N., Pine Bluff, Ark.
Harter, Isaac F., Stronghurst, Ill.
Hartnett, Eugene, Jersey City, N. J.
Heddens, Claus H., Chicago, Ill.
Hedley, Thomas A., Montreal, Can.
Henry, Charles Landon, New Albany, Ind.
Hereth, Samuel F., Chicago, Ill.
Herring, Herbert L., Dalton, Ga.
Heyerdahl, Carl Otto, Lake Park, Minn.
Hille, David J., Castle Rock, Washington.
Holzhauer, Gustavus, Newport, Ky.
Houser, Charles G., Mine La Motte, Mo.
Hudgins, Ernest F., Norfolk, Va.
Kaiser, William O., Des Moines, Ia.
Kiedaisch, John F., Keokuk, Ia.
Klein, Frederick, Chicago, Ill.
Krebs, Carl, Cleveland, O.
Kuder, Wm. F., Cleveland, O.
Lane, Edward B., Cleveland, O.
Lehnkering, Charles F., Cincinnati, O.
Lyons, Fred. W., Jersey City, N. J.
McCoy, Clarence H., Salt Lake City, Utah.
McFarland, Robert M., Henderson, Ky.
Marshall, Rush P., Philadelphia, Pa.
Matthews, Charles E., Chicago, Ill.
Mattison, Thomas C., Berea, O.
Mayo, Caswell A., New York City, N. Y.

Melville, Wm. M., Lima, O.
Metzger, George F., Bethlehem, Pa.
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Morwessel, Henry, Covington, Ky.
Noble, William W., Berea, O.
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Pattison, George H., Chicago, Ill.
Pease, Autumn Vine, Fairbury, Neb.
Potts, David G., Philadelphia, Pa.
Preissler, H. W., Shelbyville, Ky.
Probeck, George J., Cleveland, O.
Radford, Reuben L., Henderson, Ky.
Randally, Frank O., Brockton, Mass.
Reed, James, Nebraska City, Neb.
Reed, W. H., Norristown, Pa.
Sadtler, Samuel P., Philadelphia, Pa.
Sawyer, W. W., Rockford, Ill.
Scott, Alexander W., Fort Collins, Colo.
Seifert, Charles A., San Francisco, Cal.
Selzer, Eugene R., Cleveland, O.
Shafer, Erwin C., Philadelphia, Pa.
Sherrard, Charles C., Detroit, Mich.
Shultz, Merriken E., Beatrice, Neb.
Sieker, Ferdinand A., New York City, N. Y.
Smink, Robt. W., Shamokin, Pa.
Sords, Thomas V., Cleveland, O.
St. Martin, Theophilus, Wahoo, Neb.
Stork, Harry, St. Louis, Mo.
Summers, James W. F., Gould City, Mich.
Tanke, Ernest J., Chicago, Ill.
Trautmann, Ludwig, Wabasha, Minn.
Turrell, Judson W., Longmont, Colo.
Vockroth, Emil, Jersey City, N. J.
Voigt, Joseph F., Chattanooga, Tenn.
Voge, Richard, Chicago, Ill.
Walker, Joel Preston, Montezuma, Ga.
Ward, A. Jae, Adel, Ia.
Ward, George J., St. Clair, Mich.
Weber, Hermann A., Stewartsville, Mo.
Weber, John H., Cascade, Ia.
Weihe, Otto A., San Francisco, Cal.
Wells, Chas. H., Pueblo, Colo.
Wells, Edwin H., Boston, Mass.
Wilhite, Frank T., Anderson, S. C.
Woods, Silas E., Jackson, Mo.
Wooten, Thomas V., Chicago, Ill.
Wulling, Frederick J., Minneapolis, Minn.
Zimmermann, Albert, Peoria, Ill.

LIST OF PUBLICATIONS RECEIVED

FOR THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

JOSEPH P. REMINGTON,
1832 Pine Street, Philadelphia.

☞ Proceedings of State Pharmaceutical Associations, also American Pharmaceutical Journals for use of the REPORTER ON THE PROGRESS OF PHARMACY, should be sent to HENRY KRAEMER, 18 West 6oth St., New York.

American Druggist, New, York, 1893.
American Journal of the Medical Sciences, 1893.
American Journal of Pharmacy, 1893.
Anzeiger der K. K. Gesellschaft der Wissenschaften, Wien, 1893.
Bolletino delle Pubblicazioni Italiane ricevute per Diritto di Stampa, 1893.
Calendar of the Pharmaceutical Society of Ireland, 1893.
Deutsch-Amerikanische Apotheker Zeitung, New York, 1893.
Nachrichten von der Königl. Gesellschaft der Wissenschaften zu Göttingen, 1892.
Pacific Druggist, 1893.
Pharmaceutical Journal and Transactions, London, 1893.
Pharmaceutische Rundschau, New York, 1893.
Proceedings of the American Academy of Arts and Sciences, vol. xxvii., 1892.
Proceedings of the Philosophical Society of Glasgow, 1891, '92, vol. xxiii.
——— Index to the same, vol. i.–xx.
Report (71st annual) of the American Mercantile Library Association, New York.
The Canadian Pharmaceutical Journal, Toronto, 1893.
The Chemist and Druggist, London, 1893.
The Druggists' Circular, New York, 1893.
The National Druggist, St. Louis, 1893.
The Western Druggist, Chicago, 1893.
Transactions of the Academy of Science of St. Louis, Vol. v., Nos. 3 and 4.
University Extension Bulletin, Nos. 1–4, Albany, N. Y., 1893.
Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1892, 1893.
Zeitschrift des Allgemeinen Oesterreichischen Apotheker-Vereines, Wien, 1893.

LIST OF SOCIETIES, LIBRARIES AND JOURNALS,

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE FORWARDED.

The State Libraries of all the States of the Union except Connecticut. (At the request of the State Librarian of Connecticut, a copy of the Proceedings is sent to Trinity College, Hartford, Conn.)

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Arkansas.—State Library of Arkansas, Little Rock.

California.—California College of Pharmacy, 113 Fulton Street, San Francisco.
" State Library of California, Sacramento.

Colorado.—State Library of Colorado, Denver.

Connecticut.—Medical Journal and Library Association, Hartford.
" Trinity College, Hartford.
" Silas Bronson Library, Waterbury.
" Yale College, New Haven.

Delaware.—State Library of Delaware, Dover.

District of Columbia.—National College of Pharmacy, Washington, 820 I Street, N. W.
" Bureau of Education, Washington.
" Congressional Library, Washington.
" Department of Agriculture, Washington.
" Library of the American Medical Association, Washington.
" Smithsonian Institution, Washington.
" Surgeon-General United States Army, Washington.
" Surgeon-General United States Marine Hospital Service, Washington.
" Surgeon-General United States Navy, Washington.
" United States Patent Office, Washington.

Florida.—State Library of Florida, Tallahassee.

Georgia.—State Library of Georgia, Atlanta.

Illinois.—Chicago College of Pharmacy, 465 State Street, Chicago.
" Illinois College of Pharmacy, 2421 Dearborn Street, Chicago.
" The Western Druggist, 358 Dearborn Street, Chicago.
" State Library of Illinois, Springfield.

Indiana.—Department of Pharmacy, Purdue University, Lafayette.
" State Library of Indiana, Indianapolis.

Iowa.—State Library of Iowa, Des Moines.

Kansas.—Department of Pharmacy, Kansas State University, Lawrence.
" State Library of Kansas, Topeka.

Kentucky.—Louisville College of Pharmacy, First and Chestnut Streets, Louisville.
" State Library of Kentucky, Frankfort.

Louisiana.—State Library of Louisiana, Baton Rouge.

Maine.—Bowdoin College, Brunswick.
" Maine Insane Asylum, Augusta.
" State Library of Maine, Augusta.

Maryland.—Maryland College of Pharmacy, Aisquith Street, Baltimore.
" Maryland Academy of Sciences, Baltimore.
" Medical and Chirurgical Faculty of Maryland, Dr. G. L. Taneyhill, Secretary, Baltimore.
" University of Maryland, Baltimore.
" State Library of Maryland, Annapolis.

Massachusetts.—Amherst College, Amherst.
" American Academy of Arts and Sciences, Boston.
" Boston Athenæum, Boston.
" City Library, Boston.
" City Hospital, Boston.
" Harvard University, Cambridge.
" Massachusetts College of Pharmacy, Botolph and Garrison Streets, Boston.
" Massachusetts General Hospital, Boston.
" Medical Library Association, Boston.
" State Library of Massachusetts, Boston.

Mexico.—La Sociedad Mexicana de Historia Natural Museo Nacional, City of Mexico. Mexico.

Michigan.—Michigan State Medical Society, Dr. C. W. Hitchcock, Secretary, Detroit.
" The Pharmaceutical Era, 99 Woodward Avenue, Detroit.
" University of Michigan, Ann Arbor.
" State Library of Michigan, Lansing.

Minnesota.—National Wholesale Druggists' Association, A. B. Merriam, Secretary, St Paul.
" State Library of Minnesota, St. Paul.

Mississippi.—State Library of Mississippi, Jackson.

Missouri.—Academy of Science of St. Louis, St. Louis.
" National Druggist, 8th and Spruce Streets, St. Louis.
" The Druggist, 215 South 4th Street, St. Louis.
" St. Louis College of Pharmacy, 412 South 6th Street, St. Louis.
" St. Louis Mercantile Library, St. Louis.
" St. Louis Public School Library, St. Louis.
" State Library of Missouri, Jefferson City.

Montana.—State Library of Montana, Helena.

Nebraska.—State Library of Nebraska, Lincoln.

Nevada.—State Library of Nevada, Carson City.

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" State Library of New Hampshire, Concord.

New Jersey.—New Jersey State Lunatic Asylum, Trenton.
" State Library of New Jersey, Trenton.

New York.—Albany College of Pharmacy, Eagle Street, Albany.
" American Druggist, 37 College Place, New York.
" Astor Library, New York.
" College of Pharmacy of the City of New York, 211 E. 23d St., New York.
" Deutsch-Amerikanische Apotheker Zeitung, 104 John Street, New York.
" Druggists' Circular, 72 William Street, New York.
" Literary and Scientific Society of German Apothecaries, 211 East 23d Street, New York.
" Mercantile Library, New York.
" New York Academy of Medicine, 12 West 31st Street, New York.
" Pharmaceutische Rundschau, 183 Broadway, New York.
" Long Island Historical Society, Brooklyn.
" State Library of New York, Albany.

New York.—W. E. Carson, stenographer, 2 Tribune Building, New York.
North Carolina.—State Library of North Carolina, Raleigh.
North Dakota.—State Library of North Dakota, Bismarck.
Ohio.—Cincinnati Academy of Medicine, Cincinnati.
" Cincinnati College of Pharmacy, Cincinnati.
" Mussey Medical Library, Cincinnati.
" Cincinnati Hospital Library, Cincinnati.
" Longview Asylum, Carthage, Hamilton county.
" State Library of Ohio, Columbus.
Oregon.—State Library of Oregon, Salem.
Pennsylvania.—Academy of Natural Sciences, 19th and Race Streets, Philadelphia.
" American Journal of Medical Sciences, 706 Sansom Street, Philadelphia.
" American Journal of Pharmacy, 145 North 10th Street, Philadelphia.
" American Philosophical Society, 5th and Chestnut Sts., Philadelphia.
" College of Physicians, 13th and Sansom Streets, Philadelphia.
" Franklin Institute, South 7th Street, Philadelphia.
" Mercantile Library, South 10th Street, Philadelphia.
" Pennsylvania Hospital, 8th and Pine Streets, Philadelphia.
" Philadelphia College of Pharmacy, 145 North 10th Street, Philadelphia.
" Philadelphia Library, Locust and Juniper Streets, Philadelphia.
" Pittsburgh College of Pharmacy, Pittsburgh.
" State Library of Pennsylvania, Harrisburg.
Rhode Island.—State Library of Rhode Island, Providence.
South Carolina.—South Carolina Medical Association, Dr. M. P. Ravenel, Secretary Charleston.
" State Library of South Carolina, Columbia.
South Dakota.—State Library of South Dakota, Pierre.
Tennessee.—State Library of Tennessee, Nashville.
Texas.—State Library of Texas, Austin.
Vermont.—University of Vermont, Burlington.
" State Library of Vermont, Montpelier.
Virginia.—State Library of Virginia, Richmond.
Washington.—State Library of Washington, Olympia.
West Virginia.—State Library of West Virginia, Charleston.
Wisconsin.—Department of Pharmacy, University of Wisconsin, Madison.
" State Library of Wisconsin, Madison.
Canada.—Halifax Pharmaceutical Society, Halifax, Nova Scotia.
" Ontario College of Pharmacy, Toronto.
" Pharmaceutical Association of the Province of Quebec, E. Muir, Secretary. 595 Lagauchetiere Street, Montreal.
" University of Toronto, Toronto.
Mexico.—Sociedad Mexicana Historia Natural, Mexico.
Argentine Republic.—Sociedad de Farmacia Argentina, Buenos Ayres.
Austria.—Zeitschrift d. Allg. Oesterreichischen Apotheker-Vereines, Wien.
" K. K. Gesellschaft der Aertze, Wien.
" K. K. Akademie der Wissenschaften, Wien.
Belgium.—Académie Royale de Médecine de Belgique, Bruxelles.
" Société Royale de Pharmacie de Bruxelles.
" Société Royale des Sciences Médicales et Naturelles, Bruxelles.
" Société de Pharmacie d'Anvers.
Denmark.—Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
" Danmark's Apotheker Forening, Gust. Lotze, President, Odense.

France.—Bibliothèque de l'École supérieure de Pharmacie, Paris.
Germany.—Archiv der Pharmacie, Zimmerstrasse No. ¾, Berlin, S. W., 12.
" K. Akademie der Wissenschaften, Göttingen.
" K. Bayer. Akademie der Wissenschaften, München.
" K. Bibliothek der Universität Strassburg.
" Pharmaceutisches Institut, Universität Erlangen.
Great Britain.—British Pharmaceutical Conference, 17 Bloomsbury Square, London.
" Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London.
" Pharmaceutical Journal and Transactions, 17 Bloomsbury Square, London.
" Chemical News, Boy Court, Ludgate Hill, London, E. C.
" Chemist and Druggist, 44 Cannon Street, London.
" British Museum, London.
" Association of Chemists and Druggists, Wolverhampton.
" Coventry and Warwickshire Pharmaceutical Association, Coventry.
" Liverpool Chemists' Association, Liverpool.
" Pharmaceutical Society, 36 York Place, Edinburgh.
" Pharmaceutical Society of Ireland, Dublin.
" Philosophical Society, Glasgow.
Italy.—R. Biblioteca Nazionale Centrale, Firenze.
" Bollettino Chimico Farmaceutico, Via Fiori Oscuri, 11, Milano.
Netherlands.—Nederlandsche Maatschappij ter bevordering der Pharmacie, M. L. Q. van Leddon Hulsebosch, Secretary, Amsterdam.
Norway.—Kongelige Norske Universitet i Christiani.
Portugal.—Centro Pharmaceutico Portuguez, Rua do Rosario, 21, Porto.
Russia.—Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
" Pharmaceutisches Institut, Dorpat, Russia.
Sweden.—Pharmaceutical Institution, Stockholm, Sweden.
Switzerland.—Schweizerische Wochenschrift für Pharmacie, F. Seiler, Lausanne.
Australia.—Pharmaceutical Society of Victoria, Melbourne.
" Australasian Journal of Pharmacy, Melbourne.
" Pharmaceutical Society of New South Wales, Sydney.
" Pharmaceutical Society of New Zealand, Auckland.

GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

Sections Applicable to the American Pharmaceutical Association.

Class 3, Societies, Benevolent, Educational, etc.

Sec. 545. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgement of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and objects of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

Sec. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

Sec. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place, and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

Sec. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

Sec. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows: whenever any lot purchased for the use of the corporation, or any building erected thereon, shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the

corporation; said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection of another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the Recorder of Deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Approved 5 May, 1870, c. 80, v. 16, pp. 98–116—Revised Statutes of the United States, relating to the District of Columbia.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First, The corporate name of the association is the American Pharmaceutical Association.

Second, This association shall continue until dissolved by the action of its members, or by the operation of law.

Third, The objects and business of said association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

e. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

f. To uphold standards of authority in the education, theory and practice of Pharmacy.

g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth, The concerns and affairs of the Association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed:	JOHN U. LLOYD,	MAURICE W. ALEXANDER,
	ALEX. K. FINLAY,	KARL SIMMON,
	SAMUEL A. D. SHEPPARD,	JOHN M. MAISCH,
	JAMES VERNOR,	C. LEWIS DIEHL,
	WILLIAM H. ROGERS,	WM. SAUNDERS,
	ALBERT E. EBERT,	PHILIP C. CANDIDUS,
	GEORGE W. KENNEDY,	ALBERT H. HOLLISTER,
	JAMES M. GOOD,	LEWIS C. HOPP,
		WILLIAM DUPONT,
Members of the Council,		
And	JOHN A. MILBURN,	G. G. C. SIMMS,
	E. B. BURY,	Z. W. CROMWELL,
	W. S. THOMPSON,	JOHN R. MAJOR,
	CHARLES CHRISTIANI,	W. G. DUCKETT,
	A. J. SCHAFHIRT,	GEO. W. BOYD,
	O. H. COUMBE,	HENRY A. JOHNSTON,
	GEO. B. LOCKHART,	W. C. MILBURN,
	T. C. MURRAY,	ARTHUR NATTANS,
	JOSEPH R. WALTON,	THOMAS M. WEHRLY,

of the District of Columbia.

(Notaries' certificates attached to the original document attest the genuineness of eacn and every signature.)

Received for Record February 21st, 1888, at 1:05 P. M., and recorded in Liber No. 4, fol. 302, Acts of Incorporation, District of Columbia, and examined.

Signed: JAMES M. TROTTER, *Recorder*.

SEAL:
Office of Recorder of Deeds,
District of Columbia,
Washington, D. C.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all meetings of the Association, except those of the special Sections, as hereinafter provided. In his absence or inability, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. In meetings, the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all ballotings, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in cases of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, unless provided for in the By-Laws, or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

ARTICLE I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act: and shall notify every member of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall be elected annually, near the close of the annual meeting, and shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the Permanent Secretary in his duties: shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists shall be held each year, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual contributions for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of

the Council, that they may be audited; he shall receive an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual sum of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by a special vote of the Council, be invited to speak on any subject under discussion.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will

then expire, to serve for the term of three years. No elected member of the Council, after having served one term, shall be eligible for re-election to the Council to serve the next succeeding term.

ARTICLE III. The President, Vice-President, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, to be elected by ballot annually by the Council. The Secretary may or may not be a member of the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be six Standing Committees, a Committee on Commercial Interests, on the Revision of the Pharmacopœia, each to consist of five members; a Committee on Scientific Papers, a Committee on Prize Essays, and a Committee on Pharmaceutical Legislation and Education, each to consist of three members; and a Committee on Transportation, to consist of nine members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. They shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. They shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association they shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. They shall arrange the business of the Section, and shall report, near the close of each annual meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Scientific Papers previous to the first session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Scientific Papers before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

ARTICLE VII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. They shall arrange the business of the Section in advance of its meetings, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section.

ARTICLE VIII. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall be their duty to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which officinal and non-officinal remedies are

used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

ARTICLE IX. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, Denver and San Francisco, and in conjunction with the Local Secretary shall arrange for transportation from the different sections of the United States to the place of meeting and return.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and post the name in some suitable place in the meeting hall, near the beginning of a session: objection, if any, to be made in writing to the Secretary of the Council, previous to the Association taking any action on the proposition. Near the close of the same, or at a subsequent session, the Association may, by vote, invite such person to become a member, after which his membership shall be completed by his signing the Constitution and By-Laws, and paying the annual contribution for the current year.

ARTICLE III. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years.*

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer.

ARTICLE VII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE VIII. Resignations of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE IX. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE X. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, three Sections shall be formed, as follows: 1. Scientific Papers; 2. Commercial Interests; 3. Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read its minutes, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third and fourth sessions the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fifth, sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VII. At the eighth and ninth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VIII. A Chairman and Secretary shall be elected by ballot by each Section to serve at the special meeting of said Section. And the minutes of each meeting, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the Permanent Secretary for publication or safe-keeping.

ARTICLE IX. The Chairman of each Section shall preside at each of its meetings, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the next annual meeting.

ARTICLE X. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XI. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or in his absence one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States represented, requesting each State in turn to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing year; in addition to which he shall appoint five members to act with the Committee.

Section 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 8. A committee of five on time and place of meeting shall be appointed by the President at the first session, they to report at the second session.

Section 9. Incidental business may be called up.

ARTICLE XII. The order of business at the second session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the officers nominated shall be balloted for.

Section 4. The Council shall present names recommended for membership.

Section 5. Reports of Standing Committees shall be read.

Section 6. Reports of Special Committees shall be read.

ARTICLE XIII. The order of business for the meetings of the Sections shall be determined by each Section for itself.

ARTICLE XIV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XV. At the last session of the Association the newly elected officers of the Association shall take their respective places.

CHAPTER X.

Of Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. In all such points of order as are not noticed in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

SECTION ON SCIENTIFIC PAPERS.

ORDER OF BUSINESS.

First Session of the Section (Fifth of the Association).

1st. The Chairman and Secretary assume their respective places.
2d. Reading of the Chairman's address.
3d. Reports of Committees, if there be any to make, and appointment of such new Committees as may appear desirable.
4th. Nominations (but not elections at this sitting) for the new Committee on Scientific Papers. The names of members nominated to be posted in the hall on the adjournment of this session. The election not to take place until after the opening of the next session, when further nominations may also be made if it is deemed desirable.
5th. Reading of Papers and discussions on the subjects brought up.
6th. Adjournment.

Second Session of the Section (Sixth of the Association).

1st. Reading of Minutes of the previous session.
2d. Election of New Committee on Scientific Papers.
3d. Reports of Committees—Incidental Business.
4th. Reading of Papers.
5th. Adjournment.

Third Session of the Section (Seventh of the Association).

1st. Reading of Minutes of the previous session.
2d. Reading of Papers.
3d. Installation of New Officers.
4th. Reports of Committees.
5th. New Business.
6th. Reading of Minutes.
7th. Final Adjournment.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The Officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $50.

ARTICLE II. He shall post in a conspicuous place in the meeting-room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Permanent Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership who have complied with the requirements of the By-Laws of the Assoctation, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

ARTICLE IV. The Secretary of the Committee shall receive an annual salary of $150.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Meetings.

ARTICLE I. The Council shall meet previous to the assembling of the Association and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and Secretary.
2. Election of the Standing Committees of Council, as follows:

a. Committee on Membership, consisting of five members of the Council, the Permanent Secretary and Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be ballotted for at the next session of the Council, when upon receiving the votes of three-fourths of the members present, it shall becomn a part of these By-Laws.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them. I also enclose the annual contribution, five dollars, for the first year of my membership.

Name in full.....

Number and Street .....

Town and State .....

Recommended by the undersigned two members in good standing:

.....

.....

FORMS OF PROPOSITIONS AND OF COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VIII., ARTICLE II. OF THE BY-LAWS.

THE undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VIII., Article I. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES OF CANDIDATES. ADDRESS.

Proposed by .....

.....

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full.....

Date .....

Address.....

.....

To be sent to Geo. W. Kennedy, Secretary Committee on Membership A. P. A., Pottsville, Penn.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving bank-books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed, by the Council, an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Auditing Committee, at the same time and place, the bonds, saving-bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, savings-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

ROLL OF MEMBERS

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. De Meyer, *Brussels*, 1868.

Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Michael Carteighe, *London*, 1882.
Thomas Greenish, *London*, 1882.
Joseph Ince, *London*, 1882.
Richard Reynolds, *Leeds*, 1882.
Geo. F. Schacht, *Clifton, Bristol*, 1882.

FRANCE.

Dr. G. Planchon, *Paris*, 1877.

GERMANY.

Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. Carl Schacht, *Berlin*, 1882.
Dr. Edward Schaer, *Strassburg*, 1877.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.

J. von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. F. A. Flückiger, *Berne*, 1868.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPS. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Birmingham.

Hughes, James William 1891
Norton, Edward Benjamin 1888

Mobile.

Bailey, Alexander Calder 1891
Brown, Albert Edward 1887
Candidus, Philip Charles 1857
McAfee, John James. 1890
Mohr, Charles 1871
Punch, William Francis 1874
Tucker, Mosely Fleming 1888
Van Antwerp, Andrew 1890
Van Antwerp, Garet 1880

Montgomery.

Knabe, Gustavus Alexander 1876

Selma.

Galt, Edward Pegram 1883

Waverly.

Willis, John Blalock 1891

ARIZONA.

Fort Bowie.

Fouqué, Joseph 1893

Phœnix, Maricopa Co.

Eschman, Clemens Louis 1889

ARKANSAS.

Camden.

Morgan, Aylmer Lee 1890

Fort Smith.

Schaap, John 1890

Kingsland.

Anderson, Finis Logan 1892

Little Rock.

Bond, John Barnitz 1883
Gibson, James Edwin 1887
Jungkind, John August. 1887

Pine Bluff.

Anderson, James McPhuter 1893
Dewoody, William Lawrence 1887
Hart, Gilbreath Neill 1893
Valliant, George Enos 1891

Russellville.

Kerr, William Whitman 1887

Searcy.

Robertson, Felix Otey 1890

Van Buren.

Kerr, Frank Gault 1890

CALIFORNIA.

Alameda, Alameda Co.

Egeling, Berthold Frederick Gustavus. 1893
Elbe, Constantine Berthold 1877

Bakersfield, Kern Co.

Drury, John Stimson 1889

Centreville, Alameda Co.

Lernhart, August 1889

Eureka, Humboldt Bay.

Powell, Robert Baldwin 1880

Fruit Vale, Alameda Co.

Neppach, Stephen Alfred. 1889

Haywards, Alameda Co.

Hassler, Alfred Jacob 1891
Hood, John William 1891

Los Angeles.

Rives, Edward B. 1889

Marysville, Yuba Co.

Flint, John Henry 1889

Monterey.

Hilby, Francis Martin 1886

Oakland.

Flint, George Benjamin 1889
Kirkland, Derwentwater 1889
Melvin, Samuel Houston 1889
Smith, William Clay 1889

Oroville, Butte Co.

Cummins, J. Wirt 1891
Ekman, Nils Adolf 1889
Green, Robert Moore 1889

Pasadena.

Bley, Alphonso Albert Willetts 1889

Sacramento.

Helke, William Ludwig 1889
Ray, Frederick Edwards 1889

San Francisco.

Argenti, Jerome John Baptiste 1893
Bayly, Charles Alfred 1889
Calvert, John 1870
Dawson, John Henry 1882
Devine, John 1887
Grossman, Edward Lorenzo 1893
Hunt, Denis Denvin 1889
Joy, Edwin Wolcott 1882
Keil, Frederick Charles Christian 1889
Moffit, Thomas Sebatier 1861
Runyon, Edward Wheelock 1875
Schmidt, Valentine 1887
Searby, William Martin 1882
Seifert, Charles Albert 1893
Steele, James Gurden 1859
Troppmann, Charles Martin 1893
Weihe, Otto Albert 1893
Wenzell, William Theodore 1870
White, Richard Edward 1889

Santa Barbara, Santa Barbara Co.

Gutierrez, Antonio Gabriel. 1889

Santa Clara.

Oberdeener, Samuel 1889

Santa Cruz.

Fay, Hamilton 1889

Vacaville.

Miller, James Monroe 1889

Vallejo, Solano Co.

Topley, James 1869

COLORADO.

Aspen.

Long, Jonathan C. 1892

Central City.

Best, John 1866
Davies, Llewellyn Powell 1891

Denver.

Beitenman, William Wallace 1888
Black, John Reid 1891
Ford, Charles Mangan 1887
Kline, Charles Sol. 1891
Kochan, John 1888
Lord, Frank Jotham 1889
Lyneman, Felix Anthony 1892
Price, Charles Asbury 1889
Scholtz, Edmund Louis 1881
Stebbins, Harry Frank 1891
Steinhauer, Frederick 1881
Walbrach, Arthur 1881

Durango.

Strater, Henry Herman 1891

Fort Collins.

Scott, Alexander Wear 1893

Glenwood Springs, Garfield Co.

Ewing, Frederic Charles 1889

Longmont.

Turrell, Judson Wade 1893

Lyons.

Crona, Sixtus Edward Seine 1885

Pueblo.

Wells, Charles Horton 1893

South Denver.

Soetje, Edward Conrad 1888
Thurber, Almon Russell 1880

COLUMBIA, DISTRICT OF.

Washington.

Boyd, George Washington 1883
Christiani, Charles 1874
Criswell, Francis McClure 1892
Duckett, Walter G. 1876
Easterday, Herbert Clifton 1893
Halleck, William Edward 1890
Hilton, Samuel Louis 1890
Hodges, John Walter 1891
Hutton, Harry Dubant 1891
Johnston, Henry Augustus 1883
Lockhart, George Bradfield 1883
Major, John Richards 1873
Martin, John Charles 1883
McComas, Percy Grant. 1892
MILBURN, JOHN ALEXANDER 1858
Nattans, Arthur 1883
Schathirt, Adolph Julian 1876
Simms, Giles Green Craycroft 1860
Thompson, William Scott 1871
Wehrly, Thomas McAleer 1883

CONNECTICUT.

Ansonia.

Smith, Samuel Wheeler 1889

Birmingham.

Hogan, John Joseph 1890

Bridgeport.

Fisher, Elbert Ellsworth 1892
Travis, J. Walton 1888

Hartford.

Chapin, Frederick Hastings 1880
Goodwin, Lester Henry 1875
Newton, Philo Woodhouse 1892
Rapelye. Charles Andrew 1876
Shannon, Thomas Ross Alvin 1892
Stoughton, Dwight George 1890
Tracy, David Wallace 1892
Williams, John Kirby 1875

Litchfield.

Gates, Howard Eugene 1873

Middletown.

Pitt, John Richard 1872

Naugatuck.

May, James Oscar 1875

New Britain.

Perkins, Charles William 1892

New Canaan.

Winters, John Henry 1888

New Haven.

Dimock, Robert Hemphill 1889
Francis, Walter Russell. 1882
Gessner, Emil Adolph 1878
Spalding, Warren Alphonso. 1876
Sperry, Herman Jay 1880
Wood, Alonzo Felton, Jr. 1890
Wood, James Prior 1890

New London.

Huntington, William Hunter 1891
Nichols, John Cutter 1886

Norwich.

Osgood, Hugh Henry 1875
Sevin, Nathan Douglass 1875

Putnam.

Dresser, George Edward 1886

Stamford.

Haight, William Bogardus 1872

Taftville.

Ryan, Henry 1892

Thomaston.

Williams, Charles Fish 1888

Thompsonville, Hartford Co.

Smith, Edward Newton 1885
Steele, George Robert 1892

Versailles, New London Co.

Ridgway, Lemuel Augustus 1882

Waterbury.

Bossidy, Bartholomew 1889
Munson, Luzerne Ithiel 1872
Wilcox, Frederick 1878
Woodruff, Roderick Samuel 1876

West Winsted.

Phelps, Dwight 1873

Willimantic.

Wilson, Frank Milton 1883

DELAWARE.

Wilmington.

Belt, James Ferris 1892

Belt, Zedekiah James. 1876
Harvey, John Marsh 1890
Smith, Frank Roop 1890
Smith, Linton. 1870
Watson, Herbert Kennedy. 1888

FLORIDA.

Apopka, Orange Co.

Kent, Robert Restieaux 1855

De Land.

Fisher, George Washington 1893

Fort George.

Rollin, John Francis 1859

Jacksonville.

Aird, William 1887
Crum, John Darius 1892
Dell, William Amos 1890
Hughes, George 1887
Lightstone, William Henry 1891
Martinez, Robert John 1893

Key West.

Armona, Joseph Raymond de 1893
Plummer, Joseph Wellesley Verneuil Rouchefoucauldt 1892

Myers, Lee Co.

Williams, Edward Marshall 1892

Ocala.

Delouest, Edward 1890

Pensacola.

Cushman, Henry Clay 1887

St. Augustine.

Smith, Lauriston Stephen 1892
Woodman, Walter Irving 1893

Tallahassee.

Schrader, Herman von Roden 1891

Tampa.

Harris, Chester C. 1892
Harris, William Stillwell 1893
Leonardi, Sydney Beauregard 1890

GEORGIA.

Atlanta.

Avary, Moody Burt 1892
Cartledge, Edward Cornelius 1893
Cronheim, Solomon 1892
Dunwody, Richard Gaillard 1891
Schumann, Theodore 1860
Sharp, Harry 1890
Tyner, Charles Orlando 1892
Watson, Sidney Powell 1887
Watson, William Simpson 1892

Augusta.

Durban, Sebastian Charles 1883
LAND, ROBERT HENRY 1859

Columbus.

Wheat, Eli Mabry 1892

Dalton.

Herring, Herbert Lee 1893

Darien.

Cornell, Russell Wilbur 1893

Greenville.

Tigner, James Ogletree 1890

Jackson.

Wagner, William Ignatius 1892

La Grange.

Slack, Henry Richmond, Jr. 1890

Macon.

Brunner, Norman Isaac 1878
Cheatham, Thomas Alexander 1890
Ingalls, John 1876

Marietta.

Crosby, Charles Mayo 1893

Milledgeville.

Case, George Daniel 1891

Montezuma.

Walker, Joel Preston 1893

Palmetto.

Penniston, Paul 1893

Savannah.

Rowlinski, Robert Antone 1892

Summerville.

Arrington, Homer Houston 1892

Thomasville.

Bondurant, Charles Scott 1888
Thomas, Robert, Jr. 1888

IDAHO.

Caldwell.

Smithson, David Elmer 1890

Murray, Shoshone Co.

Ingalls, Albert Orfila 1885

ILLINOIS.

Arcola, Douglas Co.

Boyd, William Porter 1892

Aurora.

Staudt, Louis Carl 1890

Bloomington.

Green, Hamer Herschel 1892

Bradford, Stark Co.

Plummer, David Gorham 1869

Camp Point, Adams Co.

Bartells, George Case 1881

Carlinville, Macoupin Co.

Loehr, Theodore Christian 1888

Chicago.

Bartlett, Nicholas Gray 1864
Behrens, Emil Christian Louis 1893
Behrens, Paul Johannes Heinrich 1888
Bell, John Irving 1890
BIROTH, HENRY. 1865
Bishop, Samuel Edward 1890
Blocki William Frederick 1863
Bodemann, Wilhelm 1887
Bronson, George Styles. 1893
Button, Charles Edwin 1881
Conrad, John 1887
Dorner, Emil August 1892
Eaton, John McCoy 1892
EBERT, ALBERT ETHELBERT. 1864
Ernst, Frank Frederick 1891
Feldkamp, Charles Louis 1893
Fischer, Oscar Frederick 1892
Fleischer, Adolph Theodore. 1888
Forsyth, William Kitchin 1892
Fouke, Ernst J 1893
Frerkson, Richard Christopher 1888
FULLER, OLIVER FRANKLIN. 1869
Gale, Edwin Oscar 1857
Gale, William Henry 1857
Grassly, Charles William 1884
Gray, William. 1892
Hallberg, Carl Swante Nicanor 1879
Hartwig, Charles Ferdinand. 1881
Hartwig, Otto Julius 1892
Heddens, Claus Heising 1893
Hereth, Samuel Franklin 1893
Hogan, Louis Cass 1890
Hogey, Julius Henry. 1880
Houghton, Harry James 1891
Jamieson, Thomas Nevin 1888
Kadlec, Lawrence Wesley 1880
Kirchgasser, William Charles 1888
Klein, Frederick 1893
Knudsen, Rudolph Hans 1892
Leenheer, Bastian 1891
Lord, Thomas 1882
Lundberg, John Christian 1892
Martin, Hugo William Conrad 1881
Matthews, Charles Edwards 1893
Miner, Maurice Ashbel 1880
Morland, Robert Lawson 1892
Morris, William Gabriel 1890
Oglesby, George Daniel 1891
Oldberg, Oscar 1873
Parsons, John 1865
Patterson, Theodore Henry 1869
Pattison, George Henry 1893
Porter, Millett Nathan 1892
Puckner, William August 1888
Rhode, Rudolph Ernst 1887
Sargent, Ezekiel Herbert 1864
Scherer, Andrew 1884
Schmidt, Florian Charles 1882
Schmidt, Frederick Michael. 1887
Schwab, Leslie Watts 1892
Scott, J. McDonald. 1892
Sempill, Walter Morrison 1892
Smith, Benjamin Franklin 1892
Tanke, Ernest J. 1893
Truax, Charles 1882
Voge, Richard 1893
Wheeler, Charles Gilbert 1892
WHITFIELD, THOMAS 1865
WOLTERSDORF, LOUIS 1865
Wooten, Thomas Victor 1893
Zahn, Emil Augustus 1881

East St. Louis.

Heller, George Gordon. 1890
Knoebel, Thomas 1892

El Paso, Woodford Co.

Strathman, Charles August 1888

Grand Crossing.

Pattison, Charles Henry 1891

Highland.

Mueller, Adolphus. 1871

La Salle.

Adamick, Gustave Hattenhauer.....1891

Lincoln.

Reed, Charles Cornean 1892

Moline.

Sohrbeck, George Henry.....1888

Momence.

Culver, Anson Allen 1890

Morton, Tazewell Co.

Davis, Samuel Charles.....1893

Pekin.

Ehrlicher, Henry Michael.....1892

Peoria.

Benton, Wilber Merritt. 1888
Zimmermann, Albert 1893
Zimmermann, Charles 1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher 1881

Rockford.

Willey, Warren Sawyer. 1893

Saybrook.

Travis, Miles Beaty 1889

Streator.

Higby, William Herbert 1892

Stronghurst, Henderson Co.

Harter, Isaac Foster.....1893

INDIAN TERRITORY.

Eufaula.

Moore, Charles Gates 1892

Wagoner.

Beardsley, Joseph Laurence 1892

INDIANA.

Columbus.

Stahlhuth, Ernst Henry William.....1887

Edinburg.

Moffett, Thomas James.....1893

Evansville.

Schlaepfer, Henry John 1879

Fairmount.

Edwards, Nathan Wilson.....1879

Indianapolis.

Carter, Frank Hahneman.....1891
Cox, John Thomas 1892
Dill, John Byron 1878
Eberhardt, Ernest Godlove.....1887
Eichrodt, Charles William 1892
Field, Claud 1890
Frauer, Herman Emanuel.....1881
Hurty, John Newell.....1882
Leist, Jacob Lawrence.....1881
Lilly, Eli 1878
Lilly, Josiah Kirby.....1890
Pfafflin, Henry Adolph 1892
Shake, Homer C 1892
Sloan, George White.....1857
Zimmer, Harry Edgar 1892

Jeffersonville.

Loomis, John Clarence.....1876

La Porte.

Meissner, Frederick William, Jr.....1890

New Albany.

Henry, Charles Landon.....1893
Knoefel, August.....1879

Rockport, Spencer Co.

Anderson, Charles Burnett 1891

Seymour.

Andrews, Josiah Harding.....1879

South Bend.

Eliel, Leo 1882

Terre Haute.

Baur, Jacob.....1879

IOWA.

Adel.

Ward, Augustus Jac.....1893

Cascade, Dubuque Co.

Weber, John Henry.....1893

Chariton, Lucas Co.

Yocum, Albert Lee.....1892

Clinton.

Apel, Frederick Edmund.....1892
Majer, Oscar.....1880

Colesburg.

Dittmer, Charles Lot.....1892

Davenport.

Ballard, John Winthrop 1871
Harrison, Jacob Hugh.....1883

Decorah.

Weiser, Emilius Ilgenfritz.....1880

Des Moines.

Judisch, George 1890
Kaiser, William O. 1893
Macy, Sherman Riley.....1891
McMichael, Americus Ojeda.....1892

Dubuque.

Hervey, James 1892
Ruete, Theodore William.....1870
Torbert, Willard Horatio 1887

Fort Dodge.

Oleson, Olaf Martin.....1877

Fort Madison.

Schafer, George Henry 1871

Iowa City.

Boerner, Emil Louis.....1877

Keokuk.

Kiedaisch, John Frederick 1893

Marshalltown.

Upson, Rosa.....1887

Monticello.

Tiarks, Hermann 1876

Muscatine.

Braunwarth, Alice Louisa.....1892
Krehe, John Theodor 1884

Oskaloosa.

Pickett, John Harvey.....1887

Prairie City.

Johnson, Frank Wyatt.....1892

Sioux City.

Arnold, Charles Frederick.....1891
Crady, Edward Edmond 1892
Moore, Silas Harwood.....1880
More, Arthur James..... 1881
Scherling, Gustav.....1884

Stuart.

Treat, Joseph Augustus.....1885

Tipton.

Patton, Joseph 1892

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Atchison.

Noll, Mathias 1891

Galena.

Enterkine, James Edward.....1892

Gypsum City, Saline Co.

Schmitter, Jonathan.....1892

Hiawatha.

Miner, Mary Olds.....1892

Lawrence.

Leis, George 1869
Moore, John Thomas.....1888
Raymond, Harry Legate.....1891
Sayre, Lucius Elmer.....1883

Leavenworth.

Brown, Robert J.....1862
Mehl, Henry William 1892

Liberal, Seward Co.

Smith, George Sylvester 1892

Ottawa.

Becker, Charles Louis 1892

Peabody.

Roberts, Daniel John.....1881

Perry, Jefferson Co.

Spangler, Henry William 1888

Salina.

Seitz, Oscar.....1881

Topeka.

Merrell, Ashbel Hill.....1884
Washburn, Harry Munroe 1890

Wilmore.

Sombart, John Edward. 1881

KENTUCKY.

Anchorage.

Haeusgen, Henry Otto 1888

Carrollton.

Geier, Oscar William 1880

Covington.

Auf'mwasser, Hugo William 1892
Auf'mwasser, Julius Hermann 1893
Morwessel, Henry 1893
Pieck, Edward Ludwig 1887
Zwick, George Albert 1874

Flemingsburg.

Reynolds, John Jefferson 1876

Frankfort.

Averill, William Henry 1874
Gayle, John William 1891

Henderson.

Radford, Reuben Lee 1893
McFarland, Robert Mumford 1893

Louisville.

Beckmann, Oscar Albert 1879
Colgan, John 1867
Constantine, Edward Richard 1891
Diehl, Conrad Lewis 1863
Dilly, Oscar Charles 1888
Fischer, Phil. 1883
Fowler, Joseph William 1890
Jones, Simon Newton 1870
Kessler, Edward Frederick 1879
Mueller, Otto Edward 1888
Newman, George Abner 1866
Overstreet, William Payne 1893
Peyton, Robert Docker 1887
Pfingst, Edward Charles 1874
Pfingst, Ferdinand John 1867
Rademaker, Hermann Henry 1879
Renz, Frederick Jacob 1883
Rogers, Wiley 1874
Scheffer, Emil 1872
Schiemann, Edward Bernard 1880
Schoettlin, Albert John 1882
Snyder, Robert Johnson 1887

Newport.

Holzhauer, Gustavus 1893

Shelbyville.

Preissler, Henry Webber 1893

Somerset.

Porter, Chilton Scott 1882

Uniontown.

Hardigg, William Leopold 1881

LOUISIANA.

Baton Rouge.

Boisvert, Pierre 1891
Brooks, Claude Morley 1891

Bayou Goula.

Viallon, Paul Louis 1870

Bayou Sara.

Kilbourne, Lewis Perkins 1891

Bonnet Carré.

Donaldson, Pierre Armand 1891

Brusby Landing.

Babin, John Ephrem 1891

Franklin.

Frere, Alexander Gabriel 1882

Houma.

Fraisse, Louis Americus 1891

Minden.

Goodwill 1891

New Iberia.

Lee, Charles Hill 1891
Lee, James Augustin 1856

New Orleans.

Albrecht, Joseph 1891
Angell, Richard 1891
Bogel, William George Henry 1891
Brand, Erich 1888
Breslin, Michael Thomas 1891
Brunswig, Lucien Napoleon 1887
Chalin, Louis Fisk 1887
Dejan, John Baptist George 1891
Even, Charles 1891
Finlay, Alexander Kirkwood 1883
Girling, Robert Nash 1891
Godbold, Fabius Chapman 1887
Grambois, Augustin 1891
Graner, Albert 1891
Graner, William 1891
Grigsby, Robert Lee 1891
Hall, Charles Knap 1887
Helmann, Otto 1891

Hubert, Ernest....1891
Keppler, Charles Lewis....1891
Keppler, Christian Lewis....1882
Lalmant, Eugene....1891
Lavigne, Jean Baptist....1891
Legendre, Joseph Amilcar....1891
Lehman, John Wesley....1891
Lyons, Isaac Luria....1875
Mattingly, George James....1891
May, Eugene....1891
Metz, Abraham Louis....1887
Otto, John Nicholas Washington....1891
Robin, Oscar....1887
Rudolf, Mrs. Eliza....1887
Seeman, Charles Frederick....1891
Siekman, Ivan Francis....1891
Stendel, Julius Guthardt....1891
Storck, Jacob Ambrose....1891
Taylor, Walter Thomas....1891
Tuma, Bruno Ottokar Camillo....1891
Wunderlich, Edward....1891

Plaquemine.

Hiriart, Sebastian....1891

Port Allen.

Charroppin, Emile Lafond....1891

MAINE.

Auburn.

Robinson, William Allen....1892

Augusta.

Partridge, Charles Kimball....1867

Bangor.

Harlow, Noah Sparhawk....1859
Sweet, Caldwell....1881

Bath.

Anderson, Samuel....1876

Belfast.

Moody, Richard Henry....1876

Biddeford.

Boynton, Herschel....1875

Danforth, Washington Co.

Porter, Martin Luther....1892

Ellsworth.

Parcher, George Asa....1875

Lewiston.

Moulton, Daniel Pierce....1891
Wakefield, Seth David....1892

Pittsfield.

Libby, Henry Fitzgerald....1882

Portland.

Frye, George Carlton....1879
Hay, Edward Allston....1889
Hay, Henry Homer....1867
Illsley, George Whitfield Barrows....1891
Perkins, Benjamin Abbott....1878

Windham.

Rand, Daniel Moulton....1892

MARYLAND.

Baltimore.

Baxley, Jackson Brown....1856
Brack, Charles Emil....1876
Burrough, Horace....1883
Caspari, Charles, Jr....1883
Culbreth, David Marvel Reynolds....1883
Dohme, Alfred Robert Louis....1891
Dohme, Charles Emile....1863
Dohme, Louis....1859
Elliott, Henry Alexander....1859
Emich, Columbus Valentine....1863
Frames, John Fuller....1890
Gilpin, Henry Brooke....1889
Gosman, Adam John....1870
Hancock, John Francis....1863
Hancock, John Henry....1870
Hynson, Henry Parr....1890
Jennings, Nathaniel Hynson....1857
Lauer, Michael John....1865
Russell, Eugene James....1856
Schulze, Louis....1892
Sharp, Alpheus Phineas....1855
Simon, William....1885
Smith, Theodric....1890
Thompson, William Silver....1856
Thomsen, John Jacob,....1883
Webber, Joseph Le Roy....1886
Westcott, James Walling....1890
Winkelmann, John Henry....1864

Chestertown.

Stam, Colin Ferguson....1882

Cumberland.

Herman. John George....1878

Shriver, Henry 1876
Shryer, Thomas Wilson 1875

Frederick City.

Schley, Steiner 1878

Hagerstown.

WINTER, JONAS 1863

MASSACHUSETTS.

Abington.

Dunham, Henry Bristol 1892

Amesbury.

Dufault, Hilaire 1892
Trudel, Jacques Joseph 1892

Andover.

Parker, George Hawkins 1874

Boston.

Baker, Frederick Warren Kidder 1892
Bartlet, William Williams 1875
Bassett, Charles Harrison 1867
Boyden, Edward Cleveland 1874
Burnett, Joseph 1852
Burnham, Alfred Augustus, Jr. 1891
CANNING, HENRY 1865
Capper, William Ernest 1892
Carrol, Edward 1892
Chapin, William Arms 1880
Cobb, George Washington 1892
Colton, James Byers 1865
Copeland, Sidney Fred 1892
Cramer, Max 1881
CUTLER, EDWARD WALDO 1859
Doliber, Thomas 1859
DRURY, LINUS DANA 1871
Durkee, William Carley 1885
Gammon, Irving Parker 1891
Godding, John Granville 1875
Gorman, John Thomas Bernard 1892
Hayes, James Henry 1892
Jenkins, Luther Lincoln 1867
Jones, James Taber 1875
Kelley, Edward Samuel 1871
Leavitt, Miner La Harpe 1890
Lewis, Ernest Grant 1892
Lowd, John Colby 1871
Markoe, George Frederick Holmes ... 1863
McColgan, Adam Thomas 1892
Metcalf, Theodore 1857
Mowry, Albert Daniel 1884
Patch, Edgar Leonard 1872
Patten, Ichabod Bartlett 1858
Pierce, William Herbert 1879
Prescott, Horace Augustus 1875
Sawyer, William Frederick 1885
Scoville, Wilbur Lincoln 1891
Sharples, Stephen Paschell 1875
SHEPPARD, SAMUEL AIRUS DARLINGTON. 1865
Siegemund, Charles Augustus 1882
Sleuman, Charles Andrew, Jr. 1892
Smith, Linville Holton 1892
Squires, George Brenton 1891
Stowell, Daniel 1875
Sumner, Alphonso 1892
Tilden, Amos Kendall 1892
Tucker, Greenleaf Robinson 1890
Vargas-Heredia, Jorge 1891
Varney, Edward Francis 1892
Wells, Edwin Herbert 1893
West, Charles Alfred 1892
Wheeler, William Dexter 1892
Williams, George Gorham 1888
Wilson, Benjamin Osgood 1859

Brockton.

Randall, Frank Otis 1893

Brookfield.

Hobbs, William 1892

Cambridge.

Wood, Edward Stickney 1879

Cambridgeport.

BAYLEY, AUGUSTUS RAMSEY 1859
La Pierre, Elie Henry 1892
Laing, Alfred Allan 1888
ORNE, JOEL STONE 1859
Porter, Louis Fowler 1892

Charlestown.

Marshall, Ernest Clifton 1875
Stacey, Benjamin Franklin 1860

Chelsea.

Buck, John 1855
Buck, John Lynian 1883

Concord.

Richardson, Horatio Stillman 1892

Dover.

Colcord, Samuel Marshall 1852

East Weymouth.

Hoyt, George Melvin 1875

Fall River.

Riddell, Benjamin Franklin 1892

Fitchburg.

Estabrook, Henry Arthur 1886

Great Barrington.

Whiting, Frederick Theodore 1863

Haydenville.

Cone, Alfred George 1892

Hingham.

Hardy, Cyrus Daniel 1891

Holyoke.

Ball, Charles Ely 1885
Fortier, Lawrence Hubert 1892

Lawrence.

Glover, William Henry 1891
Walker, Charles Wilkes 1892
WHITNEY, HENRY MARTIN 1859

Lee.

Pease, Francis Merrick 1880

Lexington.

Perham, Henry Albert 1892

Lowell.

Bailey, Frederick 1869
Butler, Freeman Hall 1874
Hood, Charles Ira 1871
Robinson, Edward Augustus 1888
Thomasson, Anders 1892

Malden.

Sargent, Jesse Warren 1892

Marlborough.

Hartshorn, Frederick Arthur 1880

Methuen.

Taylor, George Arthur 1892

Middleboro.

Drake, Charles William 1873

New Bedford.

Blake, James Edwin 1866
Bunker, Elihu 1885
Hadley, Frank Rufus 1872
Lawton, Charles Henry 1873
Lawton, Horace Allen 1873
Shurtleff, Israel Hammond 1875
Taylor, John Pitman 1875
Wright, Edward Ellsworth 1886

Newburyport.

Goodwin, William W. 1853
Homer, John 1887

Newton.

Hudson, Arthur 1882

North Andover.

Berrian, George Washington 1857

North Weymouth.

Turner, Thomas Larkin 1853

Orange.

Fish, Frederic Willis 1892

Peabody.

Grosvenor, Daniel Prescott 1881

Pittsfield.

Burghardt, George Henry 1892
Fahey, Edward Francis 1892
Farrell, Thomas Henry 1892
Hydren, Carl 1892
Manning, John Henry 1889
Murphy, John Joseph 1892

Plymouth, Plymouth Co.

Carver, Frank Hahnemann 1891

Provincetown.

Adams, John Darrow 1892

Quincy.

Whall, Joseph Stokes 1873

Rockland.

Estes, Joseph Joslyn 1870

Rockport.

Blatchford, Eben 1857

Salem.

Luscomb, William Edmund 1881
Nichols, Thomas Boyden 1876
Price, Charles Henry 1882
Price, Joseph 1888

Shelburne Falls.

Baker, Edwin 1875

Somerville.

Cowdin, George Henry 1875
Flanagan, Lewis Cass 1875
Howland, Edgar Joseph 1892

South Framingham.

Bridges, Charles Herbert.....1892

Stoneham.

Ward, Charles Abraham 1891

Wellesley.

Tailby, Joseph Allen.....1892

West Acton.

Hutchins, Isaiah 1880

West Newton.

Wright, Albert Francis 1892

Woburn.

Brooks, Frederic Pratt.....1891

Worcester.

Bush, William..... 1875
Hale, Chester Stanley 1892
Scott, George Theodore.....1883
Williams, Duane Burnett.....1881

MICHIGAN.

Ann Arbor.

Brown, Henry Jefferson 1882
Eberbach, Ottmar.....1869
Mann, Albert 1889
Prescott, Albert Benjamin.....1871
Schlotterbeck, Julius Otto.....1888
Stevens, Alonzo Burdette.....1885

Armada, Macombe Co.

Phillips, Edwin Freeman.....1888

Benton Harbor.

Bird, Harry L.....1891

Coopersville, Ottowa Co.

Gillett, John.....1892

Detroit.

Baier, Charles George 1887
Bassett, Arthur.....1888
Breningstall, Reuben Grant 1891
Caldwell, James William.....1875
Dupont, William 1887
Gidday, Frederic Camdy 1893
Haynes, David Oliphant 1887
Inglis, Frank.....1887
Johnston, William, Jr.....1888
Kennedy, Ezra Joseph.....1887
McFarland, Andrew.....1891
Mitchell, Edward Travis.....1891
Parker, Arthur Sheldon.....1891
Perry, Frederick William Riley.....1885
Sherrard, Charles Cornell.....1893
Stearns, Henry Albyn.....1888
Stevens, Fred. D.....1888
Stone, Clarence George.....1884
Thompson, Frank Augustus.....1888
Vernor, James.....1866
Warren, William Matthew 1889

East Saginaw.

Prall, Delbert Elwyn.....1876

Gould City.

Summers, James Wilbur Fisk.....1893

Greenville.

Hall, William Alanson.....1888

Ionia.

Gundrum, George.....1882

Kalamazoo.

McDonald, George 1871
Todd, Albert May 1885

Manistee.

Lyman, Asahel Hubert.....1884

Muskegon.

Brundage, Fred.....1888
Jesson, Jacob.....1872

Owosso.

Parkill, Stanley E.....1887

Red Jacket, Houghton Co.

Macdonald, Daniel Turner 1884

St. Clair City.

Ward, George James.....1893

MINNESOTA.

Brainerd.

Percy, William Gil.....1892

Duluth.

Boyce, Samuel F.....1871
Sweeny, Robert Ormsby 1866

Fergus Falls.

Harding, Lawrence Arthur.....1892

Grove City.

Gayner, John Niles 1890

Lake Park.

Heyerdahl, Carl Otto.....1893

Minneapolis.

Allen, E. Floyd.....1885
Crolius, Frank Marcelous.....1884
Donaldson, Joseph Coddington.....1893
Huhn, George.....1884
Sanderson, Stephen Francis..... 1880
Wulling, Frederick John.....1893

Owatonna.

Rohde, Claus Frederick.....1885

Rochester.

Qvale, Victor Asbgörn.....1889

St. Paul.

Frost, William Arthur.....1892
King, George Alexander Newton....1892
Simmon, Karl.....1880
Warren, Edwin Alonzo.....1887

Stillwater.

Hening, James Courtenay.....1887

Wabasha.

Trautmann, Ludwig.....1893

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William.....1883
Shell, James Lemmon.....1891

Biloxi.

Duckert, Louis August.....1891

Gloster, Amite Co.

Schotel, John Charles.....1891

Jackson.

Ash, Matthew Franklin.....1856

Meridian.

Lillybeck, Oscar.....1891
Moore, Joshua Forest.....1891
White, William Henry.....1891

Natchez.

Means, John Coalter.....1891

Port Gibson.

Shreve, John Alexander.....1880

MISSOURI.

Boonsboro, Howard Co.

Finn, Thomas.....1892

Boonville.

Mittelbach, William.....1891
Wooldridge, Daniel Turley.....1890

Carrollton.

Pettit, Henry McEwen.....1860

Freeman.

Dolan, Frank Linley.....1888

Independence.

Wight, Oscar Martin.....1887

Jackson.

Woods, Silas Elliot.....1893

Kansas City.

Eyssell, George.....1889
Ford, William Thomas.....1878
Hamilton, Claude Craig.....1893
Hess, Paul Ludwig.....1892
Lahme, Charles Adolph.....1881
Willett, Gerald Howard.....1892

Lebanon.

Farrar, Samuel Richard.....1891

Marceline, Linn Co.

Shelton, William Armstrong.....1891

Marshall.

Franklin, Philip Henry.....1881

Mexico, Audrain Co.

Llewellyn, John Frederick.....1867

Mine La Motte.

Houser, Charles Gustavus.....1893

Moberly, Randolph Co.

Last, Louis Christopher August.....1888

Pierce City, Lawrence Co..

Armstrong, George Revington.....1877

Rich Hill.

Young, William.....1883

Sedalia.

Fleischmann, Augustus Theodore.....1885

St. Joseph.

Demond, Otto John.....1892

St. Louis.

Ahlbrandt, Henry Ernst.....1877
Alexander, Maurice William.....1871
Blank, Alois.....1881

Boehm, Solomon 1871
Catlin, Ephron 1871
Curtman, Charles Otto 1871
Frost, Louis Eugene 1891
Good, James Michener 1871
Grandjean, Charles 1871
Grandjean, Eugene 1871
Hassebrock, Henry Fred 1884
Hemm, Francis 1881
Hoenny, Adolph John 1890
James, Frank Lowber 1888
Klie, George Henry Charles 1878
Layton, Thomas 1892
Leitch, Arthur 1860
Loelkes, Alexander George 1891
Mallinckrodt, Edward 1869
Meyer, Christian Fred. Gottlieb 1860
Morley, William Jarman 1876
Pauley, Frank Charles 1879
Physick, Henry Sandford 1870
SANDER, ENNO 1858
Scheffer, Henry William 1863
Schurk, Louis 1890
Sennewald, Ferdinand William 1865
Sippy, Alvin Hiram 1890
Sohn, Frank 1888
Stark, Harry 1893
Tomfohrde, Charles William 1890
Tomfohrde, John William 1878
Uhlich, Ferdinand Gottlieb 1881
Vordick, August Henry 1874
Wall, Otto Augustus 1884
Westmann, Frank Henry 1882
Whelpley, Henry Milton 1887
Whitcomb, Frederick Ezekiel 1888
Wilson, Charles Frederick 1891
Wurmb, Theodore Henry 1890

Stewartsville, De Kalb Co.

Weber, Hermann August 1893

Weston.

Parr, John Conrad 1856

MONTANA.

Anaconda.

Brandon, Cole W. 1892

NEBRASKA.

Beatrice.

Shultz, Merriken Emory 1893

Fairbury.

Pease, Autumn Vine 1893

Fairfield.

Riggs, William Edward 1892

Grand Island, Hall Co.

Boyden, Henry Denio 1893
Buchheit, Augustus William 1893

Lincoln.

Daubach, Charles Joseph 1889
Kostka, Bruno Otto 1889

Nebraska City.

Reed, James 1893

Norfolk.

Koenigstein, Daniel John 1892

Omaha.

Field, Amos 1871
Goodman, Charles Frederick 1871
Kuhn, Norman Archibald 1878
Sherman, Charles Rollin 1889
Snow, Herbert Waldemar 1887

Wahoo.

St. Martin, Theophilus 1893

NEVADA.

Gold Hill.

Jones, John, Jr. 1889

Virginia City.

Perkins, William Alexander 1869

Winnemucca.

Brown, William Ambrose 1893

NEW HAMPSHIRE.

Derry Depot.

Bell, Samuel Howard 1890

Dover.

McFarland, George Francis 1892
TUFTS, CHARLES AUGUSTUS 1856

Exeter.

Wetherell, Albert Sumner 1892

Great Falls.

Hurd, John Charles 1892

Greenville.

Hall, Charles Edwin 1884

Hanover.

Downing, Lucien Bliss 1892

Keene.

Hodgkins, Bert Willis.....1888

Lebanon.

Wilder, George Patterson.....1892

Littleton.

Bowker, Everett Forrest 1892
Kenney, Herbert Eastman 1890
Robins, Wilbur Fisk 1892

Manchester.

Baril, Joseph Benjamin.....1892
Currier, Edward Hervey.....1892
Miville, Francis Charles 1877
Smith, Amasa Daniel.....1889

Marlbrough.

Emerson, Hermann Lincoln.....1892

Nashua.

Morse, Charles Milan 1888
Whitman, Nelson Samuel.....1875

New Market.

Dearborn, George Luther.....1853

Portsmouth.

Green, Benjamin 1888
Preston, Andrew Peabody 1881

Somersworth.

Moore, George.....1859

NEW JERSEY.

Asbury Park.

Woolley, Stephen Disbrow.....1888

Bayonne.

Alpers, William Charles 1890

Bloomfield.

Scherff, John Philip.....1877
Wood, George Mervin 1890

Bordentown.

Carslake, George Middleton.....1880

Bridgeton.

Dare, Charles Ford 1889
Davis, Theodore Garrison.....1890

Camden.

Beringer, George Mahlon 1893

East Orange.

Davis, George Randolph.....1883
Williams, Seward Whiting 1887

Elizabeth.

Frohwein, Richard 1867
Kent, Henry Avery, Jr. 1880
Oliver, William Murray.....1875

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, John Putnam 1881

Hoboken.

KLUSSMANN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Dougherty, Samuel Edward.....1875
Ewing, John.....1893
Gallagher, John Charles 1893
Hartnett, Eugene.....1893
Lyons, Fred. Wyckoff 1893
Vockroth, Emil 1893
White, George Henderson 1868
Wienges, Conrad.....1875

Keyport.

Warn, William Edgar 1886

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett.....1879

Morristown.

Carrell, Eugene Ayers.....1875

Mt. Holly.

WHITE, AARON SMITH 1860

Newark.

Betzler, Jacob.....1880
Bruguier, Francis.....1876
HOLZHAUER, CHARLES 1873
Mennen, Gerhard.....1888
Sayre, William Henry.....1877
Smith, Charles Bradley 1868
Smith, Clarence Pennington.....1890
Staebler, Richard Elimar Johannes...1892
Stamford, William Harrison.....1876
Van Winkle, Abraham.....1871

New Brunswick.

Kilmer, Frederick Barnett 1886
Rust, William 1870

Newton.

Ryerson, Henry Ogden 1882

Passaic.

Groetsch, George William 1892
Power, Frederick Belding 1872

Perth Amboy.

Parisen, George Warren 1892

Plainfield.

Miller, Joseph Gilbert 1886
Ollif, James Henry 1867
Reynolds, Howard Prescott 1875
Shaw, Robert Johnston 1875

Somerville.

Cook, Gilbert Snowden 1886

South Amboy.

JACQUES, GEORGE WASHINGTON 1869

NEW MEXICO.

Deming, Grant Co.

Kinnear, James Aloysius 1891

Eddy, Eddy Co.

Myhre, Olaus Gustav 1892

Kingston, Sierra Co.

Nowers, Lawrence Edward 1892

NEW YORK.

Albany.

Gaus, Charles Henry 1879
Gaus, Louis Henry 1880
Gibson, Charles 1880
Huested, Alfred Birch 1879
McClure, William Henry 1880
Michaelis, Gustavus 1882
Sautter, Louis 1879
Turner, George Heather 1880
Walker, William John 1880

Auburn.

Stanley, Edgar Clarke 1880

Binghamton.

Loveland, Charles Hungerford 1892
Otis, Clark Zelotes 1886

Brooklyn.

Aspinall, Walter Albert 1880
Bartley, Elias H. 1893
Brooks, George Washington 1879
Brundage, Albert Harrison 1892
Colen, James Austin 1892
Cutts, Foxwell Curtiss, Jr. 1875
Davis, William Mortimer 1879
DeForest, William Pendleton 1879
Dennin, Charles 1875
Dennin, Edwin Clinton 1892
Douglass, Henry, Jr. 1875
Dunn, John Augustus 1867
Eccles, Mary Hance 1892
Eccles, Robert Gibson 1885
FOUGERA, EDMOND CHARLES HENRY . 1890
Haviland, Henry 1857
Krieger, Philip 1876
Lehn, Louis 1874
Levy, Adolph 1877
Livingston, Barent Van Buren 1872
Newman, George Anthony 1865
Owens, Richard John 1860
Pfeiffer, John 1893
Ray, Peter William 1892
Reynolds, Charles Edward 1882
Snyder, Ambrose Chancellor 1867
Squibb, Edward Hamilton 1882
Squibb, Edward Robinson 1858
Stevens, Luther Fuller 1879
Werner, Rudolf Carl 1892
Zellhoefer, George 1876

Buffalo.

Chase, Walter Herbert 1892
Gregory, Willis George 1886
Hayes, Horace Phillips 1880
Mayer, John Frederick 1892
Peabody, William Huntington 1857
Rano, Charles Orlando 1866

Catskill.

Du Bois, William Laneman 1880

Corning.

Cole, Victor Le Roy 1890

Croton-on-Hudson.

Henry, Charles (Dworniczak) 1881

Dunkirk.

Davis, Eugene Miller 1892

Elmira.

Holmes, Clay Wood 1873

Fairport.

Rich, Willis Simmons 1882

Fishkill-on-Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
James, William Tefft 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Gloversville, Fulton Co.

Miller, Jason Albert 1879
Van Auken, Jerrie A. 1880

Haines Falls, Greene Co.

McElhenie, Thomas Diamond 1872

Holley, Orleans Co.

Bishop, Francis Myron 1882

Jamaica, Queens Co.

Baylis, Lewis Fosdick 1880
Goodale, Harvey Galusha 1879
Peck, George Lyman 1883

Jamestown.

Winnberg, John Magnus 1892

Kingston.

Dedrick, William Frederick 1884

Middletown.

King, James Theodore 1859
Rogers, William Henry 1869

Mount Vernon.

Gill, George 1872

Newburgh.

Chapman, Isaac Close 1887
Tartiss, Alfred Joseph 1867

New York City.

Amend, Bernard Gottwald 1892
Amend, Otto Paul 1892
Atwood, Herman White 1873
Balser, Gustavus 1875
Beardmore, William Arthur 1890
Bendiner, Samuel Julius 1882
Billings, Henry Merry 1869
Blackman, Augustus Smith 1893
Chandler, Charles Frederic 1867
Christie, James 1893
Coblentz, Virgil 1882
Cook, Thomas Penrose 1877
Ditman, Andrew Jackson 1868
Ebbitt, William Henry 1889
Eimer, Charles 1872
Elliott, Arthur Henry 1892
Fairchild, Benjamin Thomas 1875
Fairchild, Samuel William 1887
Fink, Frederick William 1886
Fisher, William 1862
Ford, Herbert Lord 1890
Foulke, James 1881
Fraser, Horatio Nelson 1888
Gardner, Robert Winslow 1867
Geisler, Joseph Frank 1889
Griffith, Albert Richard 1870
Haigh, De Laguel 1887
Hauenstein, William 1883
Hays, Benjamin Franklin 1886
Hays, David 1867
Hegeman, Johnson Niven 1880
Heydenreich, Emile 1867
Higgins, James Starkey 1862
Hoffmann, Frederick 1867
Hudnut, Alexander 1857
Hynard, Eugene Robert 1892
Ihlefeld, Conrad Heinrich 1881
Jones, James Henry 1892
Jungmann, Julius 1879
Kalish, Julius 1875
Kemp, Edward 1888
Knapp, Frank Fiero 1880
Koles, Samuel Morse 1890
Kraemer, Henry 1892
Lampa, Robert Raymond 1892
Leonhard, Rudolph Ernest 1891
Lovis, Henry Christian 1892
Maclagan, Henry 1883
Macmahan, Thomas Jackson 1871
Main, Thomas Francis 1872
Major, Alphonse 1892
Martin, Robert Rowlett 1892
Mason, Alfred Henry 1884
Massey, William Morton 1885
Mayo, Caswell A. 1893
McIntyre, Byron Floyd 1876
McIntyre, Ewen 1873
McKesson, George Clinton 1888
McKesson, John, Jr. 1867
Milhau, Edward Leon 1858

Molwitz, Ernest 1867
O'Neil, Henry Maurice 1879
Osmun, Charles Alvin 1868
Pfingsten, Gustavus 1873
Pleasants, Charles Henry 1890
Plummer, Edward 1889
Pyle, Cyrus 1859
Quackinbush, Benjamin Franklin 1886
Ramsperger, Gustavus 1860
Rice, Charles 1870
Rusby, Henry Hurd 1890
Sayre, Edward Augustus 1877
Schieffelin, William Jay 1892
Schmid, Henry 1887
SEABURY, GEORGE JOHN 1876
Shiels, George Emanuel 1860
Sieker, Ferdinand August 1893
Skelly, James Joseph 1866
Smith, Reuben Randolph 1890
Stoff, Louis Ferdinand 1892
Tscheppe, Adolph 1876
Turner, Isaac Worthington 1882
Weinman, Oscar Christian 1873
Wichelns, Frederick 1881
Wickham, William Hull 1870
Wilson, William 1876

Nyack, Rockland Co.

De Graff, David 1879

Olean.

Coon, James Van Deventer 1880

Oswego.

Butler, Charles Henry 1887

Plattsburgh.

Hitchcock, John E. 1892
Smith, John Clitherow 1892

Port Chester.

Hyler, William Henry 1875

Port Henry.

Smith, Edward Salvister 1890

Potsdam.

Thatcher, Hervey Dexter 1865

Poughkeepsie.

Odell, Willis B. 1893

Richfield Springs.

Smith, Willard Alfred 1880

Rochester.

Davis, Edward Hatch 1880
Haass, George Herman 1872
Paine, James Dixon 1857
Schmitt, Joseph Max 1882
Smith, Jay Hungerford 1883

Rome.

Owens, James Alanson 1882

Saratoga Springs.

Fish, Charles Frederick 1866

Syracuse.

Dawson, Edward Seymour, Jr. 1876
Snow, Charles Wesley 1876

Tonowanda, Erie Co.

Scoville, Charles Henry 1882

Troy.

Pennington, Thomas Henry Sands 1877

Utica.

Blaikie, William 1879
Cone, John Wright 1876
Maine, August 1892

Wellsville, Allegheny Co.

Hall, Edwin Bradford 1879

Yonkers.

Eschman, Frederick William Rudolph. 1880
Petsche, Franz Fred. Bismark William. 1892
Wray, George Brown 1888

NORTH CAROLINA.

Asheville.

Smith, Whitefoord Gamewell 1892

Charlotte.

Wearn, William Henry 1888

Durham, Orange Co.

Vaughan, Parry Wyche 1882

Fayetteville.

Horne, Henry Ruffin 1891
Sedberry, Bond English 1882

Kinston.

Parrott, John Evans 1890

Maxton.

Croom, James Dallas 1890

Oxford.

Hancock, Franklin Willis.....1888

Plymouth.

Chears, Henry Randolph 1893

Raleigh.

Hunter, Buxton Williams 1891
Simpson, Robert.....1891
Simpson, William.....1873

Tarboro.

Zoeller, Edward Victor 1878

Washington.

Gallagher, Charles Kewell.....1857

Wilmington.

Hardin, John Haywood 1881

NORTH DAKOTA.

Grafton.

Haussaman, Henry Louis.....1888

OHIO.

Akron.

Inman, Charles Trask 1885
Smith, Joseph Stahle.....1878

Berea, Cuyahoga Co.

Mattison, Thomas Clark 1893
Noble, William Wesley.....1893

Brooklyn Village.

Schmidt, Carl 1891

Bryan.

Snyder, Alva Leach.....1873

Caldwell.

Bowron, Walter Henri.....1890

Cheviot.

Hildreth, Newton Gough 1879

Chillicothe.

Howson. Arthur Bayshawe.....1886
Nipgen, John Alvin.....1879

Cincinnati.

Bain, Andrew Watson.....1874
Betz, Otto Edward.....1887
De Lang, Alfred 1887
Eger, George 1864
Fennel, Charles Theodore Piderit 1886
Fieber, Gustavus Adolphus.....1893
Gordon, William John Maclester....1854
Greve, Theodore Lund August 1864
Greyer, Julius 1880
Heineman. Otto.....1864
Hoffman, Julius 1887
Klayer, Louis 1884
Koehnken, Herman Henry.....1875
Lammert, Cyrus Joseph.....1881
Lehnkering, Charles Frederick.....1893
Lloyd, John Uri 1870
Meininger, Albert.....1881
Merrell, Charles George 1888
Merrell, George 1879
Phillips, Charles Wilson 1881
Ruppert, John 1880
Sauer, Louis Wendlin 1882
Schreck, Leocadia Santos.....1881
Serodina, Herman 1880
Simonson, William.....1887
Vilter, Hermann Theodore.....1881
Wagner, Henry 1876
Weeks, Benjamin Franklin.....1891
Wetterstroem, Albert Frederick Charles.1888
YORSTON, MATTHEW MACKAY 1864
Zuenkeler, John Ferdinand.....1887

Cleveland.

Acker, Philip 1889
Asplin, John Harding 1882
Aubley, Samuel 1888
Bartlett, John Augustus.....1893
Bechberger, Henry.....1893
Benfield, Charles William 1893
Biddle, Herbert George.....1888
Bruce, James.....1882
Cobb, Ralph Lathrop.....1883
Deutsch, Julius William.....1888
Dreher, Louis.....1881
Elliott, Sidney Thomas.....1893
Feil, Joseph.....1885
Fischer, Henry John.....1888
Flood, William Henry 1892
Gegelein, Frederick Leonhardt 1881
Gleim, John Christopher.....1893
Glines, George Walter.....1881
Haake, William Henry..... ...1893
Hahn, Sigismund Joseph Frederick...1887
Hannan, Owen Burdette.....1893
Hechler, George Louis.....1882
Hopp, Lewis Christopher 1876

Kieffer, George....1890
Krebs, Carl Julius....1893
Kuder, William Frank....1893
Kuhlmeier, Henry....1888
Lane, Edward Baxter....1893
Lehr, Philip....1885
May, Arthur Ferdinand....1851
Meyer, William Victor....1893
Myers, Daniel....1882
Probeck, George Joseph....1893
Rosewater, Nathan....1880
Schellentrager, Ernst August....1882
Schoenhut, Christian Henry....1888
Scott, Frank Genio....1891
Selzer, Eugene Reinhold....1893
Sords, Thomas Vincent....1893
Spenzer, Peter Ignatius....1872
Urban, Jacob Philip....1881
Voss, George William....1885

Columbiana.

Ink, Charles Elliott....1885

Columbus.

Bruck, Philip Henry....1884
Hatton, Edgar Melville....1878
Herbst, Frederick William....1882
Huston, Charles....1872
Karb, George James....1883
Kauffman, George Beecher....1882
Schueller, Ernst....1881
Schueller, Frederick William....1880
Sherwood, Louis Walker....1882

Conneaut, Ashtabula Co.

Simons, Arthur Henry....1892

Dayton.

Burkhardt, Mark Anthony....1887
Kurfurst, Henry Ferdinand....1881
Spengler, John George....1887

Findlay.

Firmin, John Curtis....1893

Glendale, Hamilton Co.

Feemster, Joseph Hall....1873

Grand Rapids, Wood Co.

Thurston, Azor....1886

Jefferson, Ashtabula Co.

Case, Charles Henry....1892

Lima.

Melville, William Milne....1893

Logan.

Harrington, Frank....1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor....1876
Kirchhofer, Peter Paul....1881

Middletown.

Johnson, Charles Brayton....1876

Navarre.

Grossklaus, John Ferdinand....1859

Norwood, Hamilton Co.

Weyer, John....1887

Salem, Columbiana Co.

Hawkins, Michael Smith....1870

Scio.

Beal, James Hartley....1892

Springfield.

Casper, Thomas Jefferson....1867
Siegenthaler, Harvey N....1882

Tiffin.

Fleck, Jacob J....1883

Toledo.

Hohly, Charles....1872

Troy.

Tobey, Charles William....1879

Wooster.

Ohliger, Lewis Philip....1871

OREGON.

Portland.

Blumauer, Louis....1889
Clarke, Louis Gaylord....1889
Dietrick, Howard Dickson....1889
Pfunder, William....1889
Sherwin, Eugene Alonzo....1889

The Dalles.

Blakeley, George Clarence....1892

PENNSYLVANIA.

Allegheny City.

Armor, Alpheus....1882
Eggers, Frederick Hermann....1872
Slocum, Frank Leroy....1880

Beaver, Beaver Co.

Andriessen, Hugo....1875

Bethlehem.

Metzger, George Franklin.....1893

Bristol.

Pursell, Howard.....1880
Young, John Kroesen.....1887

Carlisle.

Horn, Wilbur Fisk.....1876

Chambersburg.

Crawford, Walter Beatty, Jr.....1891
Keefer, Charles DeWalt.....1891

Connellsville.

Berryhill, Henry Pennick.....1890

Easton.

Weaver, John Archibald.....1873

Emporium, Cameron Co.

Heilman, Russell Penrose.....1889

Franklin.

Rieseman, Joseph.....1883

Harrisburg.

George, Charles Theodore.....1873
Gorgas, George Albert.....1884
Gross, Edward Ziegler.....1883
Miller, Jacob Augustus.....1873

Lancaster.

Heinitsh, Charles Augustus.....1857
Heinitsh, Sigmund William.....1889

Lebanon.

Lemberger, Joseph Lyon.....1858
Redsecker, Jacob Henry.....1881

Lock Haven.

Prieson, Adolph.....1880

Media, Delaware Co.

Jones, Edward Charles.....1864

Minersville.

Burns, John Kellar.....1876

Mt. Pleasant, Westmoreland Co.

McElwee, Emer Judson.....1888

Norristown.

Reed, Willoughby Henry.....1893
Stahler, William.....1880

Oil City.

Krosskop, William Burton.....1887

Orwigsburg, Schuylkill Co.

Binkley, George K.....1892

Philadelphia.

Apple, Franklin Muhlenberg.....1893
Bauer, Louis Gustavus.....1867
Blair, Henry Cowen.....1868
Borell, Henry Augustus.....1874
Boring, Edwin McCurdy.....1867
Bower, Henry..... 1860
Bullock, Charles.....1857
Burg, John Dellinger.....1888
Cuthbert, Richard W.....1893
Dobbins, Edwards Tompkins.....1867
Eberle, Charles Louis.....1865
Eddy, Henry Clay.....1869
Ellis, Evan Tyson.....1857
England, Joseph Winters.....1893
Fox, Peter Paul.....1869
French, Harry Banks.....1890
Früh, Carl Daniel Stephan.....1876
Gano, William Hubbell.....1892
Gerhard, Samuel.....1873
Grahame, Israel Janney.....1856
Haenchen, Charles Eugene.....1865
Hance, Edward Hance.....1857
Hancock, Charles West.....1868
Hanson, Arthur Edward.....1888
Hassinger, Samuel Ellphat Reed.....1880
Heintzelman, Joseph Augustus.....1858
Jenks, William Jenks.....1858
Jones, Alexander Henry.....1874
Keeney, Caleb Reynolds.....1868
Kline, Mahlon Norwood.....1878
Koch, Louis.....1872
Krewson, William Egbert.....1875
Lehnkering, Charles Frederick.....1893
Maisch, Henry Charles Christian.....1856
Marshall, Rush Porter.....1893
McIntyre, William.....1868
Mellor, Alfred.....1864
Miller, Adolph William.....1868
Milligan, Decatur.....1867
Moore, Joachim Bonaparte.....1860
Morris, Lemuel Iorwerth.....1880
Munson, James Harry.....1889
Newbold, Thomas Mitchell.....1876
Ogden, John.....1890
Ottinger, James Jeremiah.....1876
Peacock, Josiah Comegys.....1892
Perot, Thomas Morris.....1857
Pile, Gustavus.....1881

Poehner, Adolph Adam.....1889
Potts, David Gardiner.....1893
Preston, David 1868
Procter, Wallace.....1874
REMINGTON, JOSEPH PRICE.....1867
Richter, Gustave Adolph.....1890
Riley, Charles William.....1868
Rittenhouse, Henry Norman.....1857
Robbins, Alonzo.....1865
ROSENGARTEN, MITCHELL GEORGE....1869
Ryan, Frank Gibbs 1892
Sadtler, Samuel Philip.....1893
Shafer, Erwin Clement.....1893
Shinn, James Thornton.....1860
Shoemaker, Richard Martin.....1869
Sombart, John Edward 1881
Stedem, Frederick Will. Edward.....1892
Taylor, Alfred Bower.....1852
Thompson, William Beatty.....1858
Trimble, Henry.....1876
Warner, William Richard.....1857
Webb, William Henry.....1867
Weidemann, Charles Alexander.....1868
Wendel, Henry Edward 1873
Wiegand, Thomas Snowdon 1857
ZEILIN, JOHN HENRY 1859

Pittsburgh.

Beach, Clifton Hilliard 1883
Emanuel, Louis 1878
Finley, Ardon Chapman 1890
Finley, Norval Howard 1889
Hays, Joseph Anthony 1892
Henderson, Archibald Keys.....1888
Holland, Samuel Smith.....1876
Kelly, George Armstrong.....1882
Koch, Julius Arnold.....1892
Nisbet, William Washington 1883

Pittston.

Rhoades, Stephen Howard.....1876

Pottsville.

Deibert, Thomas Irvin.....1882
Kennedy, George Washington.....1869

Reading.

Stein, Jacob Henry 1869
Ziegler, Philip Milton 1867

Schuylkill Haven.

Commings, Charles Samuel.....1888

Scottdale, Westmoreland Co.

McNeil, John Murray 1882

Shamokin.

Smink, Robert William.....1893
Smink, William Henry R.....1885

Tarentum.

Cummings, Theodore Foster.....1882

Towanda.

Porter, Henry Carroll 1880

Warren.

Dixson, Frederick Hartley 1892

West Chester.

Evans, Joseph Spragg 1877

White Haven.

Driggs, Charles M.....1881

Wilkes-Barre.

Jones, Samuel Stephen 1887
Wolfe, Nathaniel 1878

Williamsport.

Cornell, Edward Augustus 1873
Duble, Jesse Balderston 1870
Hill, Justin Luther.....1887

York.

Patton, John Franklin.....1880

RHODE ISLAND.

Narragansett Pier.

Tobin, John Martin.....1887

Newport.

Cole, Charles Mowry.....1888
Cotton, William Henry.....1885
Downing, Benjamin Franklin, Jr. 1886

Providence.

Alfreds, Henry James 1883
Calder, Albert Layton.....1859
Cates, William Everett.....1888
Danforth, Edmund Culver 1878
Fenner, Alexander Wilson 1888
Gilbert, Charles Atwood 1891
Greene, William Ray.....1883
O'Hare, James 1888
Reynolds, William Keyes 1876
Wood, Mason Bowen 1882

Westerly.

Collins, Albert Burlingame.....1882

SOUTH CAROLINA.

Anderson.

Wilhite, Frank Turner.....1893

Charleston.

Aimar, Charles Pons.....1879
Burnham, Edward Steinmeyer.....1874
Eckel, Augustus William.....1874
Marsteller, George Ludwig.....1883

Columbia.

Thomas, Oscar Ernest.....1882

SOUTH DAKOTA.

Custer City.

Taylor, Thomas Lachlin.....1892

Howard.

Ayer, Charles Foster.....1891

Lake Preston, Kingsbury Co.

Brewer, John Weems.....1893
Keith, Irwin Alonzo.....1892

Madison.

Huecker, John.....1891

Tyndall.

Cotton, Robert M.....1893

Wessington Springs.

Hall, Nettie Crabbe.....1893

TENNESSEE.

Athens.

Carter, George Fleming.....1890

Bristol.

Bunting, Lindsay.....1890

Chattanooga.

Greve, Charles Mathias.....1887
Voigt, Joseph Frederick.....1893

Knoxville.

Gooding, Charles John.....1892
Yeager, Alvin Adams.....1888

Memphis.

Robinson, James Scott.....1869

Nashville.

Burge, James Oscar.....1878
Gordon, Richard Haden.....1891
Miller, Charles Gough.....1889

Tullahoma.

Conger, Iliff.....1891

TEXAS.

Athens.

La Rue, William Isaac.....1892

Chillicothe, Hardeman Co.

Keller, Frederick Philander Peter....1888

Dallas.

Connor, Lewis Myers.....1890
De Lorenzi, Albert.....1890
Fetterman, Thomas Moore.....1892
Keene, Thomas Rucker.....1888
Klauber, Charles Nathaniel.....1891
Schweickhardt, Richard.....1890

Denison.

Robert, William Henry, Jr.....1892

El Paso.

Irvin, William Armstrong.....1879

Ennis.

Matkin, George Garrett.....1892

Fort Worth.

Harper, Harry Winston.....1881
Powell, Thomas Wallace.....1874

Galveston.

Orton, Ingomar Francois.....1891

Granbury, Hood Co.

Morgan, Eugene Hilliard.....1892

Houston.

Burgheim, Jacob.....1892
Ross, Samuel Price.....1892

Paris.

Greiner, William Edward.....1892

San Antonio.

Cohn, Richard.....1892
Schmitt, George Joseph Francis.....1890

Tyler.

Gee, Charlie.....1893

Van Alstyne.

Neathery, James Miller.....1892

UTAH.

Park City.

Brother, William.....1892

Salt Lake City.

Druehl, Frank August 1889
Farlow, John Boylan 1889
Franken, James Latinnes..... 1892
McCoy, Clarence Herbert..... 1893

VERMONT.

Brandon.

Crossman, George Alvin..... 1872

Brattleboro.

Chapin, Henry Allen..... 1892

St. Albans.

Dutcher, Alfred Luther 1892

St. Johnsbury.

Bingham, Charles Calvin..... 1875

VIRGINIA.

Big Stone Gap.

Shelton, William Camp..... 1891

Charlottesville.

Wills, Frederick Miles..... 1890

Danville.

Cole, Howson White..... 1882

Falls Church.

Church, Merton Elbridge..... 1892

Fort Meyer.

Roberts, William..... 1892

Fredericksburg.

Hall, Marshall Carter..... 1870

Gordonsville.

Broadus, Thomas Madison 1890

Leesburg.

Purcell, Nicholas Sidney 1890

Martinsville.

Kearfott, Clarence Piercall 1890

Norfolk.

Hudgins, Ernest Franklin..... 1893
Jackson, Edward Calvert..... 1883

Petersburg.

Beckwith, Edmund Ruffin..... 1886
Knock, Thomas Franklin..... 1882

Richmond.

Baker, Thomas Roberts..... 1873
Briggs, Andrew Gessner..... 1890
Scott, William Henry 1873

WASHINGTON.

Castle Rock.

Hille, David Johnson 1893

Chelan.

Nicholson, William Sherman..... 1890

La Conner, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

Seattle.

Holmes, Henry Elliott..... 1880

Tacoma.

Cummings, Henry Thornton..... 1853

WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie..... 1872

Wheeling.

Bocking, Edmund..... 1874
Williams, William Hudson..... 1880

WISCONSIN.

Eau Claire.

Blestren, Hans Markus Gunerius..... 1889

Fountain City.

Bechman, Charles Richard 1882

Janesville.

Heimstreet, Edward Burton 1874
Prentice, Fred. F..... 1876

Tacoma.

Cummings, Henry T..... 1853

La Crosse.

Beyschlag, Charles..... 1880

Madison.

Bernhard, Charles Henry 1888
Hollister, Albert Henry..... 1884
Kremers, Edward..... 1887

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius 1884

Milwaukee.

Conrath, Adam..... 1881
Dadd, John Alfred..... 1880

Drake, John Ransom....1860
Kienth, Hans....1884
Meissner, Paul Ernest....1888
Ruenzel, Henry Gottlieb....1892
Schrank, Charles Henry....1876

Neillsville.

Sniteman, Charles Clarence....1881

West Superior.

Godding, Edward Robert....1884

Wilson, St. Croix Co.

Williams, Benjamin Christopher....1890

WYOMING.

Rawlins.

Maghee, Thomas Gillison....1892

Sheridan.

Desmond, Edward....1892

BERMUDA.

Hamilton.

Heyl, James Bell....1863

DOMINION OF CANADA.

NORTHWESTERN TERRITORY.

Regina.

Ferguson, Andrew Davis....1893

NOVA SCOTIA.

Halifax.

Simson, Francis Cook....1876

Kentville.

Masters, Robert Silas....1883

Pictou.

Fraser, Robert Peden....1885

ONTARIO.

Hamilton.

Clark, John Alexander....1890

Ottawa.

Saunders, William....1860

St. Thomas.

Foster, William Orrville....1881

Stratford.

Waugh, George James....1862

Toronto.

Lander, John Cambridge....1877
Lowden, John....1875
Robinson, Ernest Frankish....1889

Windsor.

D'Avignon, John Eugene....1888

PRINCE EDWARD ISLAND.

Charlottetown.

Dodd, Simon Walker....1884
Johnson, Arthur Sterling....1889

QUEBEC.

Montreal.

Baridon, Louis Richard....1890
Carrieré Rodrique....1893
Gray, Henry Robert....1867
Hedley, Thomas Albert....1893
Lachance, Seraphin....1888
Morland. Robert Lawson....1892
Morrison, Joseph Edward....1888

Three Rivers.

Williams, Richard Wellington....1883

HAWAIIAN ISLANDS.

Honolulu.

Lyons, Albert Byron....1885

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Arny, Harry Vin, Berlin, Germany....1891
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Birchfield, Wellington W 1891
Brown, James 1888
Macmillan, Andrew Jackson 1892
McConville, Thomas Aloysius 1864
McPherson, George 1865
Raynale, Frank Bertrand 1891
Reichardt, Frederick Alfred 1871
Rumsey, Samuel Louis 1876
Schmidt, Ferdinand Traugott 1886
Wardell, Robert C. 1860

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Kan. Bk. bldg., Charleston, Kan. co., W. Va.
Boisvert, Pierre,
39 Boulevard, Baton Rouge, La.
Bond, John B.,
Main & 5th sts., Little Rock, Ark.
Bondurant, Charles S.,
Broad st., Thomasville, Ga.
Borell, Henry A.,
2043 Chestnut st., Philadelphia, Pa.
Boring, Edwin M.,
929 Fairmount ave., Philadelphia, Pa.
Bossidy, Bartholomew,
41 E. Main st., Waterbury, Conn.
Bower, Henry,
Gray's Ferry Road & 29th st., Philad'a, Pa.
Bowker, Everett F.,
28 Main st., Littleton, N. H.
Bowron, Walter H.,
Caldwell, O.
Boyce, Samuel F.,
335 W. Superior st., Duluth, Minn.
Boyd, George W.,
C st., N. E., near 2d, Washington, D. C.
Boyd, William P.,
25 1st South st., Arcola, Douglas co., Ill.
Boyden, Edward C.,
Joy & Myrtle sts., Boston, Mass.
Boyden, Henry D.,
Grand Island, Neb.
Boynton, Herschell,
74 Main st., Biddeford, Maine.
Brack, Charles E.,
Ensor & Forrest sts., Baltimore, Md.
Brand, Erich,
Magazine & Jackson sts., New Orleans, La.
Brandon, Cole W.,
Main & 1st sts., Anaconda, Mont.
Braunwarth, Alice L.,
114 E. 2d st., Muscatine, Ia.
Breningstall, Reuben G.,
764 W. Fort st., Detroit, Mich.

Breslin, Michael T.,
101 St. Peter st., New Orleans, La.
Brewer, John W.,
Lake Preston, Kingsbury co., S. Dak.
Bridges, Charles H.,
18 Union ave., S. Framingham, Mass.
Briggs, Andrew G.,
Main & 1st sts., Richmond, Va.
Broadus, T. Madison,
Gordonsville, Va.
Bronson, George S.,
381 W. Van Buren St., Chicago, Ill.
Brooks, Claude M.,
210 Main st., Baton Rouge, La.
Brooks, Frederic P.,
361 Main st., Woburn, Mass.
Brooks, George W.,
1161 Myrtle ave., Brooklyn, N. Y.
Brother, William,
Main st., Park City, Utah.
Brown, Albert E.,
16 Dauphin st., Mobile, Ala.
Brown, Henry J.,
2 Main st., Ann Arbor, Mich.
Brown, James,
Residence unknown.
Brown, Robert J.,
113 Delaware st., Leavenworth, Kan.
Brown, William A.,
Winnemucca, Nev.
Bruce, James,
544 Prospect st., Cleveland, O.
Bruck, Philip H.,
961 S. High st., Columbus, O.
Bruguier, Francis,
Hamburg Place & Lafayette st., Newark, N.J.
Brundage, Albert H.,
1157 Gates ave., Brooklyn, N. Y.
Brundage, Fred.,
21 Terrace st., Muskegon, Mich.
Brunner, Norman I.,
4th & Arch sts., Macon, Ga.
Brunswig, Lucien N.,
Magazine & Gravier sts., New Orleans, La.
Buchheit, Aug. W.,
119 W. 3d st., Grand Island, Neb.
Buck, John,
267 Broadway, Chelsea, Mass.
Buck, John L.,
267 Broadway, Chelsea, Mass.
Bullock, Charles,
528 Arch st., Philadelphia, Pa.
Bunker, Elihu,
403 Purchase st., New Bedford, Mass.
Bunting, Lindsay,
Main st., Bristol, Tenn.
Burg, John D.,
4th & Brown sts., Philadelphia, Pa.
Burge, James O.,
Broad & Market sts., Nashville, Tenn.
Burghardt, George H.,
7 North st., Pittsfield, Mass.
Burgheim, Jacob,
911 Congress ave., Houston, Tex.
Burkhardt, Mark A.,
Third & St. Clair sts., Dayton, O.
Burnett, Joseph,
27 Central st., Boston, Mass.
Burnham, Alfred A., Jr.,
459 Dudley st., Boston, Mass.
Burnham, Edward S.,
369 King st., Charleston, S.C.
Burns, J. Kellar,
Sunbury & Lecona sts., Minersville, Pa.
Burrough, Horace,
405 W. Camden st., Baltimore, Md.
Bush, William,
56 Front st., Worcester, Mass.
Butler, Charles H.,
182 W. 1st st., Oswego, N. Y.
Butler, Freeman H.,
141 Central st., Lowell, Mass.
Button, Charles E.,
744 W. Van Buren st., Chicago, Ill.
Calder, Albert L.,
183 N. Main st., Providence, R. I.
Caldwell, James W.,
242 Grand River ave., Detroit, Mich.
Calvert, John,
Kearney & Clay sts., San Francisco, Cal.
Candidus, Philip C.,
Mobile, Ala.
CANNING, HENRY,
109 Green st., Boston, Mass.
Capper, William E.,
278 Dartmouth st., Boston, Mass.
Carrell, Eugene A.,
South st., Morristown, N. J.
Carrierè, Rodrique,
1341 St. Catherine, Montreal, Can.
Carrol, Edward,
Woolsey Sq., Jamaica Plain, Boston, Mass.
Carslake, George M.,
Farnsworth ave., Bordentown, N. J.

Carter, Frank H.,
300 Massachusetts ave., Indianapolis, Ind.
Carter, George F.,
Athens, Tenn.
Cartledge, Edward C.,
102 Whitehall St., Atlanta, Ga.
Carver, Frank H.,
Main st., Plymouth, Plymouth co., Mass.
Case, Charles H.,
Jefferson, Ashtabula co., O.
Case, George D.,
Milledgeville, Ga.
Caspari, Charles, Jr.,
Maryland Col. of Pharmacy, Baltimore, Md.
Casper, Thomas J.,
41 E. Main st., Springfield, O.
Cates, William E.,
145 Prairie ave., Providence, R. I.
Catlin, Ephron,
6th st. & Washington ave., St. Louis, Mo.
Chalin, Louis F.,
Carrolton & St. Chas. aves. New Orleans, La.
Chandler, Charles F.,
4th ave. & E. 49th st., New York, N. Y.
Chapin, Fred. H.,
259 Main st., Hartford, Conn.
Chapin, Henry A.,
80 Main st., Brattleboro, Vt.
Chapin, William A.,
Beach & Lincoln sts., Boston, Mass.
Chapman, Isaac C.,
111 Water st., Newburgh, N. Y.
Charroppin, Emile L.,
Port Allen, La.
Chase, Walter H.,
306 W. Ferry st., Buffalo, N. Y.
Chears, Henry R.,
Plymouth, N. C.
Cheatham, Thomas A.,
Mulberry & 3d sts., Macon, Ga.
Christiani, Charles,
484 Pennsylvania ave., Washington, D. C.
Christie, James,
82–84 Fulton st., New York, N. Y.
Church, Merton E.,
Falls Church, Va.
Clark, John A.,
East King st., Hamilton, Ontario, Can.
Clark, Louis G.,
141 1st st., Portland, Oregon.
Cobb, George W.,
176 Saratoga st., E. Boston, Mass.
Cobb, Ralph L.,
112 Superior st., Cleveland, O.
Coblentz, Virgil,
211 E. 23d st., New York, N. Y.
Cohn, Richard,
816 W. Commerce st., San Antonio, Tex.
Colcord, Samuel M.,
Dover, Mass.
Cole, Charles M.,
302 Thames st., Newport, R. I.
Cole, Howson W.,
429 Main st., Danville, Va.
Cole, Victor L.,
22 East Market st., Corning, N. Y.
Colen, James A.,
383 Court st., Brooklyn, N. Y.
Colgan, John,
10th & Walnut sts., Louisville, Ky.
Collins, Albert B.,
48 Main st., Westerly, R. I.
Colton, James B..
766 Tremont st., Boston, Mass.
Commings, Charles S.
Main & St. Peter sts., Schuylkill Haven, Pa.
Cone, Alfred G.,
1 Bridge st., Haydenville, Mass.
Cone, John W.,
205 Genesee st., Utica, N. Y.
Conger, Iliff,
Tullahoma, Tenn.
Connor, L. Myers,
1101 Elm st., Dallas, Tex.
Conrad, John,
239 State st., Chicago, Ill.
Conrath, Adam,
630 Chestnut st., Milwaukee, Wis.
Constantine, Edward R.,
200 W. Green st., Louisville, Ky.
Cook, Gilbert S.,
Somerville, N. J.
Cook, Thomas P.,
Care Merck & Co., 71 William St., N. Y. City.
Coon, James V. D.,
111 Union st., Olean, N. Y.
Copeland, Sidney F.,
450 Boylston st., Boston, Mass.
Cornell, Edward A.,
Pine & 4th sts., Williamsport, Pa.
Cornell, Russell W.,
Darien, Ga.
Cotton, R. M.,
Tyndall, S. Dak.

Cotton, William H.,
226 Thames st., Newport, R. I.
Cowdin, George H.,
25 Union Square, Somerville, Mass.
Cox, John T.,
480 E. Washington st., Indianapolis, Ind.
Crady, Edward E.,
509 4th st., Sioux City, Ia.
Cramer, Max,
1350 Tremont st., Boston, Mass.
Crawford, Walter B., Jr.,
Main & Queen sts., Chambersburg, Pa.
Criswell, Francis M.,
7th & Florida ave. N. W., Washington, D.C.
Crolius, Frank M.,
14–16 5th st., Minneapolis, Minn.
Crona, Sixtus E. S.,
Lyons, Boulder co., Col.
Cronheim, Solomon,
101 Whitehall st., Atlanta, Ga.
Croom, Jas. D.,
Maxton, N. C.
Crosby, Charles M.,
Marietta, Ga.
Crossman, George A.,
2 Simonds' Block, Brandon, Vt.
Crum, John D,,
2d ave. & Union st., Jacksonville, Fla.
Culbreth, David M. R.,
Charles & Eager sts., Baltimore, Md.
Culver, Anson A.,
Momence, Ill
Cummings, Henry T.,
Tacoma, Wash.
Cummings, Theodore F.,
Tarentum, Va.
Cummings, J. Wirt,
Bird & Huntoon sts., Oroville, Butte co., Cal.
Currier, Edward H.,
782 Elm st., Manchester, N. H.
Curtman, Charles O.,
3718 North 9th st., St. Louis, Mo.
Cushman, Henry C.,
Government st., Pensacola, Fla.
Cuthbert, Richard W.,
4000 Chestnut st., Philadelphia, Pa.
CUTLER, E. WALDO,
89 Broad st., Boston, Mass.
Cutts, Foxwell C., Jr.,
981 Fulton st., Brooklyn, N. Y.
Dadd, John A.,
221 Grand ave., Milwaukee, Wis.
Danforth, Edmund C.,
163 Westminster st., Providence, R. I.
Dare, Charles F.,
84 E. Commerce st., Bridgeton, N. J.
Daubach, Charles J.,
1520 U st., Lincoln, Neb.
Davies, Llewellyn P.,
Central City, Col.
D'Avignon, J. Eugene,
55 Sandwich st., Windsor, Ont., Can.
Davis, Edward H.,
101 State st., Rochester, N. Y.
Davis, Eugene M.,
309 Lion st., Dunkirk, N. Y.
Davis, George R.,
545 Main st., East Orange, N. J.
Davis, Samuel,
Roseville, Warren co., Ill.
Davis, Theo. G.,
118 E. Commerce st., Bridgeton, N. J.
Davis, William M.,
630 Marcy ave., Brooklyn, N.Y.
Dawson, Edward S., Jr.,
125 So. Salina st., Syracuse, N. Y.
Dawson, John H.,
23d & Valencia sts., San Francisco, Cal.
De Armona, Joseph R.,
608 Duval st., Key West, Fla.
De Forest, William P.,
397 Classon ave., Brooklyn, N. Y.
De Graff, David,
P. O. Box 201, Nyack, Rockland co., N. Y.
De Lang, Alfred,
Broadway & 4th sts., Cincinnati, O.
De Lorenzi, Albert,
Main & Ervay sts., Dallas, Tex.
Dearborn, George L.,
156 Main st., New Market, N. H.
Dedrick, Wm., Fred.,
28 Wall st., Kingston, N. Y.
Deibert, Thomas I.,
103 North Centre st., Pottsville, Pa.
Dejan, J. B. George,
360 Dryades st., New Orleans, La.
Dell, Wm. A.,
Bay & Laura sts., Jacksonville, Fla.
Delouest, Edward,
Ocala, Fla.
Demond, Otto J.,
3d & Edmond sts., St. Joseph. Mo.
Dennin, Charles,
383 Court st., Brooklyn, N. Y.

Dennin, Edwin C.,
383 Court st., Brooklyn, N. Y.
Desmond, Edward,
Sheridan, Wyoming.
Deutsch, Julius W.,
74 Euclid ave., Cleveland, O.
Devine, John,
Kearney & Clay sts., San Francisco, Cal.
Dewoody, William L.,
Pine Bluff, Jefferson co., Ark.
Diehl, C. Lewis,
3d & Broadway, Louisville, Ky.
Dietrick, H. Dickson,
P. O. Box 62, Portland, Oregon.
Dill, J. Byron,
Indianapolis, Ind.
Dilly, Oscar C.,
2101 West Walnut st., Louisville, Ky.
Dimock, Robert H.,
303 Congress st., New Haven, Conn.
Ditman, Andrew J.,
10 Astor House, New York, N. Y.
Ditman, Charles L.,
Colesburg, Iowa.
Dixson, Frederick H.,
Glade ave. & 1st st., East Warren, Pa.
Dobbins, Edward T.,
1100 Washington ave., Philadelphia, Pa.
Dodd, Simon W.,
101 Queen st., Charlottetown, P. E. I., Can.
Dohme, Alfred R. L.,
Pratt & Howard sts., Baltimore, Md.
Dohme, Charles E,,
Pratt & Howard sts., Baltimore, Md.
Dohme, Louis,
Pratt & Howard sts., Baltimore, Md.
Dolan, Frank L.,
Freeman, Cass co., Mo.
Doliber, Thomas,
41 Central Wharf, Boston, Mass.
Donaldson, Joseph C.,
110 South 12th st., Minneapolis, Minn.
Donaldson, Pierre A.,
Bonnet Carré, La.
Dorner, Emil A.,
557 N. Clark st., Chicago, Ill.
Dougherty, Samuel E.,
234 Bergen ave., Jersey City, N. J.
Douglass, Henry, Jr.,
612 Wythe ave., Brooklyn, N. Y.
Downing, Benjamin F., Jr.,
42 Broadway, Newport, R. I.
Downing, Lucien B.,
Hanover, N. H.
Drake, Charles W.,
275 Main st., Middleboro, Mass.
Drake, John R.,
365 East Water st., Milwaukee, Wis.
Dreher, Louis,
302 Euclid ave., Cleveland, O.
Dresser, George E.,
Main st., Putnam, Conn.
Driggs, Charles M.,
Railroad & Berwick sts, White Haven, Pa.
Druehl, Frank A.,
Main & 3d South sts, Salt Lake City, Utah.
Drury, John S.,
Chester ave., Bakersfield, Kern co., Cal.
Drury, Linus D.,
Warren & Dudley sts., Boston, Mass.
Duble, Jesse B.,
Pine & 4th sts., Williamsport, Pa.
Du Bois, William L.,
281 Main st., Catskill, N. Y.
Duckert, Louis A.,
Gulf Quarantine Station, Biloxi, Miss.
Duckett, Walter G.,
22d st. & Penn ave., Washington, D. C.
Dufault, Hilaire,
60 Friend st., Amesbury, Mass.
Dunham, Henry B.,
P. O. Box 67, Abington, Mass.
Dunn, John A.,
56 Doughty st., Brooklyn, N. Y.
Dunwody, Richard G.,
369 Piedmont ave., Atlanta, Ga.
Dupont, William,
182 Michigan ave., Detroit, Mich.
Du Puy, Eugene,
520 Hancock st., Brooklyn, N. Y.
Durkee, William C.,
Boylston & Berkeley sts., Boston, Mass.
Dutcher, Alfred L.,
109 Main st.. St. Albans, Vt.
Easterday, Herbert C.,
New Jersey ave. & G st, N.W., Wash'gt'n, D.C.
Eaton, John M.,
334 Dearborn st., Chicago, Ill.
Ebbitt, William H.,
170 William st., New York, N. Y.
Eberbach, Ottmar,
12 South Main st., Ann Arbor, Mich.
Eberle, Charles L.,
4779 Germantown ave., Philadelphia, Pa.

Ebert, Albert E.,
426 State st., Chicago, Ill.
Eccles, Robert G.,
191 Dean st., Brooklyn, N. Y.
Eckel, Augustus W.,
231 King st., Charleston, S. C.
Eckford, Joseph Wm.,
Commerce st., Aberdeen, Miss.
Eddy, Henry C.,
18th & Lombard sts., Philadelphia, Pa.
Edwards, Nathan W.,
Main st., Fairmount, Ind.
Egeling, B. F. Gustavus,
Larkin & Geary sts., San Francisco, Cal.
Eger, George,
839 Central ave., Cincinnati, O.
Eggers, Frederick H.,
172 E. Ohio st., Allegheny City, Pa.
Ehrlicher, Henry M.,
334 Court st., Pekin, Ill.
Eichrodt, Charles W.,
503 North West st., Indianapolis, Ind.
Eimer, Charles,
130 E. 18th st., New York, N. Y.
Ekman, N. Adolf,
Oroville, Cal.
Elbe, Constantine B.,
Park st., Alameda, Cal.
Eliel, Leo,
101 Main st., South Bend, Ind.
Elliott, Arthur H.,
211 E. 23d st., New York, N. Y.
Elliott, Henry A.,
673 W. Lexington st., Baltimore, Md.
Elliott, Sidney T.,
32 John St., Cleveland, O.
Ellis, Evan T.,
335 S. 18th St., Philadelphia, Pa.
Emanuel, Louis,
2d ave. & Grant st., Pittsburgh, Pa.
Emerson, Hermann L.,
Marlborough, N. H.
Emich, Columbus V.,
423 N. Howard st., Baltimore, Md.
England, Joseph W.,
Philadelphia Hospital, Philadelphia, Pa.
Enterkine, James E.,
2d & Main sts., Galena, Kan.
Ernst, Frank F.,
56 W. Randolph St., Chicago, Ill.
Eschman, Clemens L.,
Phoenix, Maricopa county, Arizona.
Eschmann, F. W. R.,
P. O. Box 875, Yonkers, N. Y.
Estabrook, Henry A.,
Fitchburg, Mass.
Estes, Joseph J.,
Union & Church sts., Rockland, Mass.
Evans, Joseph S.,
P. O. Box 657, West Chester, Pa.
Even, Charles,
201 N. Ramparts st., New Orleans, La.
Ewing, Frederic C.,
Grand ave. & 8th st., Glenwood Springs, Col.
Ewing, John,
282 Montgomery St., Jersey City, N. J.
Eyssell, George,
1036 Union ave., Kansas City, Mo.
Fahey, Edward F.,
173 North st., Pittsfield, Mass.
Fairchild, Benjamin T.,
84 Fulton st., New York, N. Y.
Fairchild, Samuel W.,
84 Fulton st., New York, N. Y.
Farlow, John B.,
Main & 1st South sts., Salt Lake City, Utah.
Farrar, Samuel R.,
Opera House Block, Lebanon, Mo.
Farrell, Thomas H.,
173 North st., Pittsfield, Mass.
Fay, Hamilton,
Pacific ave., Santa Cruz, Cal.
Feemster, Joseph H.,
Glendale, Hamilton co., O.
Feil, Joseph,
Cleveland, O.
Feldkamp, Chas. L.,
1127 N. Clark St., Chicago, Ill.
Fennel, Charles T. P.,
8th & Vine sts., Cincinnati, O.
Fenner, Alexander W.,
351 Westminster st., Providence, R. I.
Ferguson, Andrew D.,
Scarth st., Regina, N. W. T.
Fetterman, Thomas M.,
P. O. Box 398, Dallas, Texas.
Fieber, Gustavus A.,
100 Spring Grove ave., Cincinnati, O.
Field, Amos,
Richardson Drug Co., Omaha, Neb.
Field, Claud,
318 E. St. Clair st., Indianapolis, Ind.
Fink, Frederick Wm.,
128 William st., New York, N. Y.

Finlay, Alexander K.,
186 Camp st., New Orleans, La.
Finley, Ardon C.,
Dairy ave., Pittsburgh, E. E., Pa.
Finn, Thomas,
Boonsboro, Howard co., Mo.
Firmin, John C.,
319 S. Main St., Findlay, Hancock co., O.
Fischer, Henry J.,
439 Pearl st., Cleveland, O.
Fischer, Oscar F.,
1558 Wabash ave., Chicago, Ill.
Fischer, Phil.,
848 W. Market st., Louisville, Ky.
Fish, Chas. F.,
348 Broadway, Saratoga Springs, N. Y.
Fish, Frederic W.,
Orange, Mass.
Fisher, Elbert E.
144 Park ave., Bridgeport, Conn.
Fisher, Geo. W.
DeLand, Florida.
Fisher, William,
327 Bleecker st., New York, N. Y.
Flanagan, Lewis C.,
589 Somerville ave., Somerville, Mass.
Fleck, Jacob J.,
3 Washington st., Tiffin, O.
Fleischer, Adolph T.,
296 N. Market st., Chicago, Ill.
Fleischmann, Augustus T.,
4th & Ohio sts., Sedalia, Mo.
Flint, Geo. B.,
1171 Broadway, Oakland, Cal.
Flint, John H.,
Marysville, Yuba co., Cal.
Flood, William H.,
1403 Woodland ave., Cleveland, O.
Ford, Charles M.,
700 15th st., Denver, Col.
Ford, Herbert L.,
96 Maiden Lane, New York, N. Y.
Ford, W. Thomas,
1305 Cherry st., Kansas City, Mo.
Forsyth, William K.,
3100 State st., Chicago, Ill.
Fortier, Lawrence H.,
372 High st., Holyoke, Mass.
Foster, William O.,
221 Talbot st., St. Thomas, Ontario, Can.
Fougera, Edmond C. H.,
309 8th st., Brooklyn, N. Y.
Foulke, James,
91 Fulton st., New York, N. Y.
Fouque, Joseph,
Mare Island, Cal.
Fowler, Jos. W.,
200 W. Green st., Louisville, Ky.
Fox, Peter P.,
Woodland ave. & 73rd st., Philadelphia, Pa.
Fraisse, Louis A.,
Main st., Houma, Terrebonne Parish, La.
Frames, J. Fuller,
601 N. Gay st., Baltimore, Md.
Francis, Walter R.,
170 Orange st., New Haven, Conn.
Franken, James L.,
Main & 3d South sts., Salt Lake City, Utah.
Franklin, Philip H.,
N. side Public Square, Marshall, Mo.
Fraser, Horatio N.,
262 5th ave., New York, N. Y.
Fraser, Robert P.,
Water st., Pictou, Nova Scotia.
Frauer, Herman E.,
246 E. Washington st., Indianapolis, Ind.
French, Harry B.,
429 Arch st., Philadelphia, Pa.
Frere, Alexander G.,
Main st., St. Mary's Parish, Franklin, La.
Frerksen, Richard C.,
1201 W. North ave., Chicago, Ill.
Frohwein, Richard,
122 1st st., Elizabethport, N. J.
Frost, Louis E.,
700 Olive st., St. Louis, Mo.
Frost, William A.,
119 E. 3d st., St. Paul, Minn.
Früh, Carl D. S.,
2445 Ridge ave., Philadelphia, Pa.
Frye, George C.,
320 Congress st., Portland, Me.
Fuller, Oliver F.,
220 Randolph st., Chicago, Ill.
Gale, Edwin O.,
85 S. Clark st., Chicago, Ill.
Gale, William H.,
85 S. Clark st., Chicago, Ill.
Gallagher, Charles K.,
2nd st., Washington, N. C.
Gallagher, John C.,
466 Grove st., Jersey City, N. J.
Galt, Edward P.,
924 Broad st., Selma, Ala.

Gammon, Irving P.,
150 Dudley st., Boston, Mass.
Gano, William H.,
1634 Columbia ave., Philadelphia, Pa.
Gardner, Robert W.,
158 William st., New York, N. Y.
Gates, Howard E.,
Care of Wessells & Gates, Litchfield, Conn.
Gaus, Charles H.,
202 Washington ave., Albany, N. Y.
Gaus, Louis H.,
254 S. Pearl st., Albany, N. Y.
Gayle, John W.,
Ann & Market sts., Frankfort, Ky.
Gayner, John N.,
Grove City, Minn.
Gegelein, Frederick L.,
Payne & Case aves., Cleveland, O.
Gee, Charles,
Tyler, Tex.
Geier, Oscar W.,
175 Main st., Carrollton, Ky.
Geisler, Joseph F.,
6 Harrison st., New York, N. Y.
George, Charles T.,
1306 N. 3d st., Harrisburg, Pa.
Gerhard, Samuel,
1400 Hanover st., Philadelphia, Pa.
Gessner, Emil A.,
301 Chapel st., New Haven, Conn.
Gibson, Charles,
74 State st., Albany, N. Y.
Gibson, James E.,
Main & Markham sts., Little Rock, Ark.
Gidday, Frederic C.,
534 4th ave., Detroit, Mich.
Gilbert, Charles A.,
1 Whittemore Pl., Providence, R. I.
Gill, George,
P. O. Box 17, Mount Vernon, N. Y.
Gillett, John,
Coopersville, Ottowa Co., Mich.
Gilpin, Henry B.,
Light & Lombard sts., Baltimore, Md.
Girling, Robert N.,
344 Prytania st., New Orleans, La.
Gleim, John C.,
303 Superior st., Cleveland, O.
Glines, George W.,
147 Franklin ave., Cleveland, O.
Glover, William H.,
591 Essex st., Lawrence, Mass.
Godbold, Fabius C.,
361 Magazine st., New Orleans, La.
Godding, Edward R.,
West Superior, Wis.
Godding, John G.,
278 Dartmouth st., Boston, Mass.
Good, James M.,
2348 Olive st., St. Louis, Mo.
Goodale, Harvey G.,
P. O. Box 29, Jamaica, Queens co., N. Y.
Gooding, Charles J.,
135 Gay st., Knoxville, Tenn.
Goodman, Charles F.,
1110 Farnham st., Omaha, Neb.
Goodwill,
Goodwill Block, Minden, La.
Goodwin, Lester H.,
State & Main sts., Hartford, Conn.
Goodwin, William W.,
Newburyport, Mass.
Gordon, Richard H.,
200 N. Cherry st., Nashville, Tenn.
Gordon, William J. M.,
710 Plum st., Cincinnati, O.
Gorgas, George A.,
6 Market Square, Harrisburg, Pa.
Gorman, John T. B.,
49 Melrose st., Boston, Mass.
Gosman, Adam J.,
Charles & Mulberry sts., Baltimore, Md.
Grahame, Israel J.,
28 N. 12th st., Philadelphia, Pa.
Grambois, Augustin,
121 Esplanade st., New Orleans, La.
Grandjean, Charles.
2828 N. 14th st., St. Louis, Mo.
Grandjean, Eugene,
2828 N. 14th st., St. Louis, Mo.
Graner, Albert,
449 St. Charles st., New Orleans, La.
Graner, William,
468 Barronne st., New Orleans, La.
Grassly, Charles W.,
287 W. 12th st., Chicago, Ill.
Gray, Henry R.,
122 St. Lawrence st., Montreal, Que., Can.
Gray, William,
843 Fulton st., Chicago, Ill.
Green, Benjamin,
12 Market Square, Portsmouth, N. H.
Green, Hamer H.,
220 N. Centre st., Bloomington, Ill.

Green, Robert M.,
Myers st., Oroville, Butte co., Cal.
Greene, William R.,
1 Westminster st., Providence, R, I.
Gregory, Willis G.,
112 Niagara st., Buffalo. N. Y.
Greiner, William E.,
104 N. Side Sq., Paris, Tex.
Greve, Charles M.,
6th & Market sts., Chattanooga, Tenn.
Greve, Theodore L. A.,
John & 6th sts., Cincinnati, O.
Greyer, Julius,
Vine & Findlay sts., Cincinnati, O.
GRIFFITH, ALBERT R.,
2241 3d ave., New York, N. Y.
Grisby, Robert L.,
168 Camp st., New Orleans, La.
Groetsch, George W.,
?17 Passaic st., Passaic, N. J.
Gross, Edward Z.,
119 Market st., Harrisburg, Pa.
Grossklaus, John F.,
High st. and Public Square, Navarre, O.
Grossman, Edward L.,
Cooper Medical College, San Francisco, Cal.
Grosvenor, Daniel P., Jr.,
35 Main st., Peabody, Mass.
Gundrum, George,
Ionia, Mich.
Gutierrez, Antonio G.,
State & Ortega sts., Santa Barbara, Cal.
Haake, William H.,
85 Greenwood st., Cleveland, O.
Hadley, Frank R,,
64 N. 2d st., New Bedford, Mass.
Haenchen, Charles E.,
3844 Haverford ave., Philadelphia, Pa.
Haeusgen, H. Otto,
Anchorage, Ky.
Hahn, Sigsmund J. F.,
473 Scoville ave., Cleveland, O.
Haigh, De Laguel,
49 Broadway, New York, N. Y.
Haight, William B.,
Care Lockwood & Haight, Stamford, Conn.
Hale, Chester S.,
974 Main st., Worcester, Mass.
Hall, Charles E.,
Main st., Greenville, N. H.
Hall, Charles K.,
77 Tchoupitoulas st., New Orleans, La.
Hall, Edwin B.,
173 Main st., Wellsville, Allegheny co., N.Y.
Hall, Marshall C.,
Care of Hall Brothers, Fredericksburg. Va.
Hall, Nettie C.,
Main st., Wessington Springs, So. Dak.
Hall, William A.,
Cass & Lafayette sts., Greenville, Mich.
Hallberg, Carl S. N.,
358 Dearborn st., Chicago, Ill.
Halleck, Wm. E.,
5th & H sts., N. W., Washington, D. C.
Hamilton, Claude C.,
913 East 10th st., Kansas City, Mo.
Hance, Edward H.,
Callowhill & Marshall sts., Phila., Pa.
Hancock, Charles W.,
3421 Spring Garden st., Philadelphia, Pa.
Hancock, Franklin W.,
Oxford, N. C.
Hancock, John F..
4 South Howard st., Baltimore, Md.
Hancock J. Henry,
800 W. Lombard st., Baltimore, Md.
Hannan, Owen B.,
693 Cedar ave., Cleveland, O.
Hanson, Arthur E.,
12 S. 34th st., Philadelphia, Pa.
Hardigg, William L.,
2d near Main st., Uniontown, Ky.
Hardin, John H.,
124 Front st., Wilmington, N. C.
Harding, Lawrence A.,
112 Lincoln ave., Fergus Falls, Minn.
Hardy, Cyrus D.,
Lafayette ave., Hingham, Mass.
Harlow Noah S.,
4 Smith's Block, Bangor, Me.
Harper, Harry W.,
7th & Houston sts., Fort Worth, Tex.
Harrington, Frank,
Main & Market sts., Logan, O.
Harris, Chester C.,
502 Franklin st., Tampa, Fla.
Harris, William S.,
502 Franklin st., Tampa, Fla.
Harrison, Jacob H.,
305 Brady st., Davenport Ia.
Hart, Gilbreath N.,
424 Main st., Pine Bluff, Ark.
Harter, Isaac F.,
Stronghurst, Ill.

Hartnett, Eugene,
105 Montgomery st., Jersey City, N. J.
Hartshorn, Frederick A.,
15 Mechanics' st., Marlborough, Mass.
Hartwig, Charles F.,
476 Milwaukee ave., Chicago, Ill.
Hartwig, Otto J.,
1570 Milwaukee ave., Chicago, Ill.
Harvey, John M.,
407 Delaware ave., Wilmington, Del.
Hassebrock, Henry F.,
1901 Wright st., St. Louis, Mo.
Hassinger, Samuel E. R.,
Fairmount ave. & 23d st., Philadelphia, Pa.
Hassler, Alfred J.,
Haywards, Alameda co., Cal.
Hattenhauer, Robert C.,
1429 Water st., Peru, Ill.
Hattan, Edgar M.,
56 S. Fourth st., Columbus, O.
Hauenstein, William,
375 Amsterdam ave., New York, N. Y.
Haussamann, Henry L.,
Grafton, N. Dak.
Haviland, Henry,
488 Nostrand ave., Brooklyn, N. Y.
Hawkins, M. Smith,
84 Main st., Salem, Columbiana co., O.
Hay, Edward A.,
Middle & Free sts., Portland, Me.
Hay, Henry H.,
Free & Middle sts., Portland, Me.
Hayes, Horace P.,
312 Elk st., Buffalo, N. Y.
Hayes, James H.,
305 Sumner st., E. Boston, Mass.
Haynes, David O.,
835 Jefferson ave., Detroit, Mich.
Hays, B. Frank,
543 Fifth ave., New York, N. Y.
Hays, David,
207 Division st., New York, N. Y.
Hays, Joseph A.,
147 S. 18th st., Pittsburgh, Pa.
Hechler, George L.,
1099 Broadway, Cleveland, O.
Heddens, Claus H.,
117 Wells st., Chicago, Ill.
Hedley, Thomas A.,
41 St. Jean Baptiste st., Montreal, Can.
Hegeman, J. Niven,
770 Broadway, New York, N. Y.
Heiman, Russell P.,
Emporium, Cameron co., Pa.
Heimstreet, Edward B.,
Janesville, Wis.
Heinemann, Otto,
Laurel & Linn sts., Cincinnati, O.
HEINITSH, CHARLES A.,
16 East King st., Lancaster, Pa.
Heinitsh, Sigmund W.,
120 S. Prince st., Lancaster, Pa.
Heintzelman, Joseph A.,
Ridge & College aves., Philadelphia, Pa.
Helke, William L.,
2d & K sts., Sacramento, Cal.
Heller, George G.,
Missouri ave. & 5th st., East St. Louis, Ill.
Helmann, Otto,
206 Poydras st., New Orleans, La.
Hemm, Francis,
3907 S. Broadway, St. Louis, Mo.
Henderson, Archibald K.,
300 Frankstown ave., Pittsburgh, Pa.
Hening, James C.,
226 Chestnut st., Stillwater, Minn.
Henry, Charles (Dworniczak),
Croton-on-Hudson, N. Y.
Henry, Charles L.,
443 East Spring st., New Albany, Ind.
Hepburn, John,
103 Main st., Flushing, N. Y.
Herbst, Frederick W.,
446 S. High st., Columbus, O.
Hereth, Samuel F.,
284 Belden ave., Chicago, Ill.
Hermann, John G.,
Baltimore & Mechanic sts., Cumberland, Md.
Herring, Herbert L.,
Hamilton st., Dalton, Ga.
Hervey, James,
704 Main st., Dubuque, Ia.
Hess, Paul L.,
Independence & Forest aves., Kansas City, Mo.
Heydenreich, Emile,
30 N. Williams st., New York, N. Y.
Heyerdahl, Carl Otto,
Lake Park, Minn.
Heyl, James B.,
Vice-Consul, Hamilton, Bermuda.
Higby, William H.,
215 Main st., Streator, Ill.
Higgins, James S.,
1880 Lexington ave., New York, N. Y.

Hilby. Francis M.,
Monterey Pharmacy, Monterey, Cal.
Hildreth, Newton G.,
Cheviot, O.
Hill, Justin L.,
3d & Mulberry sts., Williamsport, Pa.
Hill, David J.,
Front st., Cattle Rock, Wash.
Hilton, Samuel L.,
1033 22d st., N. W., Washington, D. C.
Hiriart, Sebastian,
Bank & Plaquemine sts., Plaquemine, La.
Hitchcock, John E.,
39 Oak st., Plattsburgh, N. Y.
Hobbs, William,
Brookfield, Mass.
Hodges, J. Walter,
Penn ave. & 2d st. S. E., Washington, D. C.
Hodgkins, Bert W.,
39 Central Square, Keene, N. H.
Hoenny, Adolph J.,
3631 N. Grand ave., St. Louis, Mo.
Hoffman, Julius,
429 Central ave., Cincinnati, O.
Hoffmann, Frederick,
183 Broadway, New York, N. Y.
Hogan, John J.,
78 Elizabeth st., Birmingham, Conn.
Hogan, Louis C.,
6443 Yale st., Englewood, Chicago, Ill.
Hogey, Julius H.,
3038 Cottage Grove ave., Chicago, Ill.
Hohly, Charles,
602 S. St. Clair st., Toledo, O.
Holland, Samuel S.,
Smithfield & Liberty sts., Pittsburgh, Pa.
Hollister, Albert H.,
3 N. Pinckney st., Madison, Wis.
Holmes, Clay W.,
410 West Gray st., Elmira, N. Y.
Holmes, Henry E.,
Seattle, Wash.
Holzhauer, Charles,
787 Broad st., Newark, N. J.
Holzhauer, Gustavus,
10th & Monmouth sts., Newport, Ky.
Homer, John,
156 High st., Newburyport, Mass.
Hood, Charles I.,
Merrimac & Central sts., Lowell, Mass.
Hood, John W.,
Calhoun st., Haywards, Alameda co., Cal.
Hopp, Lewis C.,
198 Euclid ave., Cleveland, O.
Horn, Wilbur F.,
32 West Main st., Carlisle, Pa.
Horne, Henry R.,
Hay st., Fayetteville, Cumberland co., N. C.
Houghton, Harry J.,
Wentworth av.&66th,Englewood,Chicago,Ill.
Houser, Charles G.,
Mine La Motte, Mo.
Howland, Edgar J.,
376 Somerville ave., Somerville, Mass.
Howson, Arthur B.,
Paint & Main sts., Chillicothe, O.
Hoyt, George M.,
East Weymouth, Mass.
Hubert, Ernest,
335 Esplanade ave., New Orleans, La.
Hudgins, Ernest F.,
473 Church st., Nanpark, Va.
Hudnut, Alexander,
218 Broadway, New York, N. Y.
Hudson, Arthur.
Centre st., Newton, Mass.
Huecker, John.
Madison, S. Dakota.
Huested, Alfred B.,
77 Eagle st., Albany, N. Y.
Hughes, George,
1 W. Bay st., Jacksonville, Fla.
Hughes, James W.,
19th st. & 2d ave., Birmingham, Ala.
Huhn, George,
123 Nicollet st., Minneapolis, Minn.
Hunt, Denis D.,
301 5th st., San Francisco, Cal.
Hunter, Buxton W.,
Fayetteville st., Raleigh, N. C.
Huntington, William H.,
10 Federal st., New London, Conn.
Hurd, John C.,
26 Market st., Great Falls, N. H.
Hurty, John N.,
104 N. Penn st., Indianapolis, Ind.
Huston, Charles,
47 S. High st., Columbus, O.
Hutchins, Isaiah,
West Acton, Mass.
Hutton, Harry D.,
1033 22d st., N. W., Washington, D. C.
Hydren, Carl,
223 North st., Pittsfield, Mass.

Hyler, William H.,
Port Chester, N. Y.
Hynard, Eugene R.,
2143 7th ave., New York, N. Y.
Hynson, Henry P.,
421 N. Charles st., Baltimore, Md.
Ihlefeld, Conrad H.,
715 8th ave, New York, N. Y.
Illsley, George W. B.,
159 Clark st., Portland, Me.
Ingalls, Albert O.,
Murray, Shoshone co., Idaho.
Ingalls, John.
4th & Poplar sts., Macon, Ga.
Inglis, Frank,
177 Griswold st., Detroit, Mich.
Ink, Charles E.,
Columbiana, O.
Inman, Charles T.,
1184 E. Market st., Akron, O.
Irvin, William A.,
El Paso, Texas.
Jackson, Edward C.,
523 Church st., Norfolk, Va.
Jacques, George W.,
Broadway & Augusta st., S. Amboy, N. J.
James, Frank L.,
615 Locust st., St. Louis, Mo.
James, William T.,
20 Main st., Flushing. N. Y.
Jamieson, Thomas N.,
3900 Cottage Grove ave., Chicago, Ill.
Jenkins, Luther L.,
119 Leverett st., Boston, Mass.
Jenks, William F.,
4043 Market st., Philadelphia, Pa.
Jennings, N. Hynson,
336 N. Charles st., Baltimore, Md.
Jesson, Jacob,
Western ave & Jefferson st., Muskegon, Mich.
Joergensen, Sophus,
Commercial st., La Conner, Skagit co., Wash.
Johnson, Arthur S.,
Kent st., Charlottetown, P. E. I., Can.
Johnson, Charles B.,
54 Third st., Middletown, O.
Johnson, Frank W.,
Prairie City, Ia.
Johnston, Harry A.,
1001 O st., N. W., Washington, D. C.
Johnston, William, Jr.,
121 Jefferson ave., Detroit, Mich.
Jones, Alexander H.,
9th & Parrish sts., Philadelphia, Pa.
Jones, Edward C.,
33 E. 4th st., Media, Pa.
Jones, James H.,
3d ave. & 189th st., New York, N. Y.
Jones, James T.,
855 E. 4th st., Boston, Mass.
Jones, John, Jr.,
194 Main st., Gold Hill, Storey co., Nev.
Jones, Samuel S.,
54 Market st., Wilkes-Barre, Pa.
Jones, Simon N.,
1st & Jefferson sts., Louisville, Ky.
Joy, Edwin W.,
Mason & Post sts., San Francisco, Cal.
Judisch, George,
W. 5th & Walnut sts., Des Moines, Ia.
Jungkind, John A.,
806 Main st., Little Rock, Ark.
Jungmann, Julius,
1047 3d ave., New York, N. Y.
Kadlec, Lawrence W.,
179 W. 12th st., Chicago, Ill.
Kaiser, Wm. O.,
903 6th ave., Des Moines, Ia.
Kalish, Julius,
413 Grand st., New York, N. Y.
Karb, Geo. J.,
4th & Main sts., Columbus, O.
Kauffman, George B.,
235 N. High st., Columbus, O.
Kearfott, Clarence P.,
Martinsville, Va.
Keefer, Chas. D.,
Main & Queen sts., Chambersburg, Pa.
Keene, Thomas R.,
Dallas, Tex.
Keeney, Caleb R.,
16th & Arch sts, Philadelphia, Pa.
Keil, Fred. C.,
2000 Market st., San Francisco, Cal.
Keith, Irwin A.,
Lake Preston, Kingsbury Co., S. Dak.
Keller, Fred. P. P.,
Chillicothe, Hardeman county, Tex.
Kelley, Edward S.,
Boylston & Berkley sts., Boston, Mass.
Kelly, George A.,
101 Wood st., Pittsburgh, Pa.
Kemp, Edward,
68 William st., New York, N. Y.

Kennedy, Ezra J.,
709 Woodward ave., Detroit, Mich.
Kennedy, George W.,
103 N. Centre st., Pottsville, Pa.
Kenney, Herbert E.,
Littleton, N. H.
Kent, Henry A., Jr.,
Park Drug Store, Elizabeth, N. J.
Kent, Robert R.,
Apopka, Orange co., Fla.
Keppler, Charles L.,
471 Dryades st., New Orleans, La.
Keppler, Christian L.,
461 Dryades st., New Orleans, La.
Kerr, Frank G.,
Van Buren, Ark.
Kerr, William W.,
Russellville, Ark.
KESSLER, EDWARD F.,
20th & Market sts., Louisville, Ky.
Kiedaisch, John F., Jr.,
1028 Main st., Keokuk, Ia.
Kieffer, George,
620 Lorain st., Cleveland, O.
Kienth, Hans,
608 Mitchell st., Milwaukee, Wis.
Kilbourne, Lewis P.,
Bayou Sara, La.
Kilmer, Frekerick B.,
17 Codnise ave., New Brunswick, N. J.
King, George A. N.,
400 Sibley st., St. Paul, Minn.
KING, JAMES T.,
Main & South sts., Middletown, N. Y.
Kinnear, James A.,
Deming, N. Mex.
Kirchgasser, Wm. C.,
5347 S. Halsted st., Chicago, Ill.
Kirchhofer, Paul,
Massillon, Stark co., O.
Kirkland, Derwentwater,
973 Broadway, Oakland, Cal.
Klauber, Charles N.,
566½ Elm st., Dallas, Tex.
Klayer, Louis,
9th & Elm sts., Cincinnati, O.
Klein, Frederick,
322 W. Madison st., Chicago, Ill.
Klle, G. H. Charles,
5100 N. Broadway, St. Louis, Mo.
Kline, Charles S.,
19th & Welton sts., Denver, Col.
Kline, Mahlon N.,
427 Arch st., Philadelphia, Pa.
KLUSSMANN, HERMANN,
4th st., & Lafayette ave., Hoboken, N. J.
Knabe, Gustavus A.,
Court Square & Dexter av., Montgomery, Ala.
Knapp, Frank F.,
362 Hudson st., New York, N. Y.
Knock, Thomas F.,
130 South ave., Petersburg, Va.
Knoebel, Thomas,
209 Collinsville ave., East St. Louis, Ill.
Knoefel, August,
19 W. Market st., New Albany, Ind.
Knudsen, Rudolph H.,
285 Noble st., Chicago, Ill.
Koch, Julius A.,
12th & Carson sts., Pittsburgh, Pa.
Koch, Louis,
329 N. 4th st., Philadelphia, Pa.
Kochan, John,
1463 Larimer st., Denver, Col.
Koehnken, Herman H.,
4th & Mill sts., Cincinnati, O.
Koenigstein, Daniel J.,
5th & Main sts., Norfolk, Neb.
Koles, Samuel M.,
214 Delancey st., New York, N. Y.
Kostka, Bruno O.,
1224 O st., Lincoln, Neb.
Kraemer, Henry,
209 E. 23d st., New York, N. Y.
Krebs, Carl,
1223 Cedar ave., Cleveland, O.
Krehe, J. Theodor,
314 E. 2d st., Muscatine, Iowa.
Kremers, Edward,
435 Park st., Madison, Wis.
Krewson, William E.,
1836 Franklin st., Philadelphia, Pa.
Krieger, Philip,
Tompkins, cor. Myrtle ave., Brooklyn, N. Y.
Krosskop, William B.,
Oil City, Venango co., Pa.
Kuder, William F.,
342 Jennings ave., Cleveland, O.
Kuhlmeier, Henry,
523 Pearl st., Cleveland, O.
Kuhn, Norman A.,
124 S. 15th st., Omaha, Neb.
Kurfurst, Henry F.,
502 Xenia ave., Dayton, O.

La Pierre, Elie H.,
96 River st., Cambridgeport, Mass.
La Rue, William I.,
Athens, Texas.
Lachance, Seraphin,
1538 St. Catherine st., Montreal, Can.
Lahme, Charles A.,
428 Main st., Kansas City, Mo.
Laing, Alfred A.,
273 Pearl st., Cambridgeport, Mass.
Lalmant, Eugene,
Gasquet & Claiborne sts., New Orleans, La.
Lammert, C. Joseph,
Park ave., Walnut Hills, Cincinnati, O.
Lampa, Robert R.,
128 William st., New York, N. Y.
LAND ROBERT H.,
812 Broad st., Augusta, Ga.
Lander, John C.,
Yorkville, Toronto, Can.
Lane, Edward B.,
1197 Euclid ave., Cleveland, O.
Last, Louis,
317 Reed st., Moberly, Mo.
Lauer, Michael J.,
Myrtle & Harlem aves., Baltimore, Md.
Lavigne, Jean B.,
261 N. Poydras st., New Orleans, La.
Lawton, Charles H.,
91 Union st., New Bedford, Mass.
Lawton, Horace A.,
91 Union st., New Bedford, Mass.
Layton, Thomas,
2743 N. Grand ave., St. Louis, Mo.
Leavitt, Miner L. H.,
65 Cambridge st., Boston, Mass.
Lee, Charles H.,
Main st., New Iberia, La.
LEE, JAMES A.,
Main st., New Iberia, La.
Leenheer, Bastian,
871 W. 22d st., Chicago, Ill.
Legendre, Joseph A.,
25 Dauphin st., New Orleans, La.
Lehman, John W.,
168 Camp st., New Orleans, La.
Lehn, Louis,
45 Strong Place, Brooklyn, N. Y.
Lehnkering, Charles F.,
744 Eastern ave., Cincinnati, O.
Lehr, Philip,
1145 Lorain st., Cleveland, O.
Leis, George,
747 Massachusetts st., Lawrence, Kan.
Leist, Jacob L.,
100 E. Washington st., Indianapolis, Ind.
Leitch, Arthur,
2348 Olive st., St. Louis, Mo.
LEMBERGER, JOSEPH L.,
5 N. 9th st., Lebanon, Pa.
Leonardi, Sydney B.,
Franklin st., Tampa, Fla.
Leonhard, Rudolph E. (Vanderbilt Clinic),
10th ave. & 60th st., New York, N. Y.
Lernhart, August,
Centreville, Alameda co., Cal.
Levy, Adolph,
125 Grant st., E. D., Brooklyn, N. Y.
Lewis, Ernest G.,
701 Centre st., Jamaica Plain, Boston, Mass.
Libby, Henry F.,
Main st., Pittsfield, Me.
Lightstone, William H.,
Bay & Clay sts., Jacksonville, Fla.
Lilly, Eli,
Care of Eli Lilly & Co., Indianapolis, Ind.
Lilly, Josiah K.,
Indianapolis, Ind.
Lillybeck, Oscar,
5th st. & 23d ave., Meridian, Miss.
Livingston, Barent V. B.,
306 Broadway, Brooklyn, N. Y.
Llewellyn, John F.,
Public Square, Mexico, Audrian co., Mo.
Lloyd, John U.,
Court & Plum sts., Cincinnati, O.
Lockhart, George B.,
32d & O sts., West Washington, D. C.
Loehr, Theodore C.,
Carlinville, Macoupin co., Ill.
Loelkes, Alexander G.,
2348 Olive st., St. Louis, Mo.
Long, Jonathan C.,
Fee Corrugs Drug Store, Aspen, Col.
Loomis, John C.,
Chestnut & Watt sts., Jeffersonville, Ind.
Lord, Frank J.,
1101 Larimer st., Denver, Col.
Lord, Thomas,
72 Wabash ave., Chicago, Ill.
Loveland, Charles H.,
392 Chenango st., Binghamton, N. Y.
Lovis, Henry C.,
238 W. 131st st., New York, N. Y.

Lowd, John C.,
43 Temple Place, Boston, Mass.
Lowden, John,
53 Colborne st., Toronto, Can.
Lundberg, John C.,
186 W. Madison st., Chicago, Ill.
Luscomb, William E.,
289 Essex st., Salem, Mass.
Lyman, Asahel H.,
427 W. River st., Manistee, Mich.
Lyneman, Felix A.,
1336 19th st., Denver, Col.
Lyons, Albert B.,
Honolulu, Sandwich Islands.
Lyons, Fred W.,
464 Bergen st., Jersey City, N. J.
Lyons, Isaac L.,
42 Camp st., New Orleans, La.
Macdonald, Daniel T.,
Red Jacket, Houghton co., Mich.
Maclagan, Henry,
91 Fulton st., New York, N. Y.
Macmahan, Thomas J.,
172 6th ave., New York, N. Y.
Macmillan, Andrew J.,
Residence unknown.
Macy, Sherman R.,
Highl'd Park NormalCollege,Des Moines,Ia.
Maghee, Thomas G.,
5th & Cedar sts., Rawlins, Wyo.
Main, Thomas F.,
278 Greenwich st., New York, N. Y.
Maine, August,
352 Whitesboro st., Utica, N. Y.
Maisch, Henry C. C.,
10th & Ogden sts., Philadelphia, Pa.
Majer, Oscar,
400 S. 2d st., Clinton, Ia.
Major, Alphonse,
232 William st., New York, N. Y.
Major, John R.,
800 7th st., Washington, D. C.
Mallinckrodt, Edward,
Mallinckrodt & Main sts., St. Louis, Mo.
Mann, Albert,
39 S. Main st., Ann Arbor, Mich.
Manning, John H.,
51 North st., Pittsfield, Mass.
Markoe, George F. H.,
27 Central st., Boston, Mass.
Marshall, Ernest C.,
157 Bunker Hill st., Charlestown, Mass.
Marshall, Rush P.,
16th & Race sts., Philadelphia, Pa.
Marsteller, George L.,
231 King st., Charleston, S. C.
Martin, Hugo W. C.,
358 State st., Chicago, Ill.
Martin, John C..
U. S. Nav. Dispensary, Washington, D. C.
Martin, Nicholas H.,
Northumb'dRd.,Newcastle-upon-Tyne, Eng.
Martin, Robert R.,
41 John st., New York, N. Y.
Martinez, Robt. J.,
Bay & Bridge sts., Jacksonville, Fla.
Mason, Alfred H.,
59 Maiden Lane, New York, N. Y.
Massey, William M.,
1129 Broadway, New York, N. Y.
Masters, Robert S.,
Main st., Kentville, Nova Scotia.
Matkin, George G.,
Care of J. M. Pelters, Ennis, Tex.
Matthews, Charles E.,
221 Randolph st., Chicago, Ill.
Mattingly, George J.,
1164 Magazine st., New Orleans, La.
Mattison, Thomas C.,
Berea, Cuyahoga Co., O.
May, Arthur F.,
227 Garden st., Cleveland, O.
May, Eugene,
Canal & Chartres sts., New Orleans, La.
May, James O.,
Water st., Naugatuck, Conn.
Mayer, John F.,
242 Forrest ave., Buffalo, N. Y.
Mayo, Caswell A.,
37 College Place, New York City, N. Y.
McAfee, John J.,
252 Beauregard st., Mobile, Ala.
McClure, William H.,
74 State st., Albany, N. Y.
McColgan, Adam T.,
507 Tremont st., Boston, Mass.
McComas, Percy G.,
1801 Vermont ave., Washington, D. C.
McConville, Thomas A.,
Residence unknown.
McCoy, Clarence H.,
87 E. Second S. st. Salt Lake City, Utah.
McDonald, George,
Main & Burdick sts., Kalamazoo, Mich.

McElhenie, Thomas D.,
Haines Falls, Green co., N. Y.
McElwee, Emer J.,
517 Main st., Mount Pleasant, Pa.
McFarland, Andrew,
693 Michigan ave., Detroit, Mich.
McFarland, George F.,
203 Central ave., Dover, N. H.
McFarland, Robt. M.,
418 Washington st., Henderson, Ky.
McIntyre, Byron F.,
Care of Reed & Carnrick, New York, N. Y.
McIntyre, Ewen,
39 W. 18th st., New York, N. Y.
McIntyre, William,
2429 Frankford ave., Philadelphia, Pa.
McKesson, G. Clinton,
91 Fulton st., New York, N. Y.
McKesson, John, Jr.,
91 Fulton st., New York, N. Y.
McMichael, Americus O.,
1438 Grand ave., Des Moines, Ia.
McNeil, John M.,
143 Broadway, Scottdale, Westm'l'd co., Pa.
McPherson, George,
Residence unknown.
Means, John C.,
123 N. Commerce st., Natchez, Miss.
Mehl, Henry W.,
5th & Delaware sts., Leavenworth, Kan.
Meininger, Albert,
Vine & 12th sts., Cincinnati, O.
Meissner, F. W., Jr.,
820 Main st., La Porte, Ind.
Meissner, Paul E.,
519 Astor st., Milwaukee, Wis.
Mellor, Alfred,
218 N. 22d st., Philadelphia, Pa.
Melville, William M.,
Lima, O.
Melvin, Samuel H.,
6th ave. & 14th st., East Oakland, Cal.
Mennen, Gerhart,
577 Broad st., Newark, N. J.
Merrell, Ashbel H.,
6th ave. & Clay st., Topeka, Kan.
Merrell, Charles G.,
6th st. & Eggleston ave., Cincinnati, O.
Merrell, George,
6th st. & Eggleston ave., Cincinnati, O.
Metcalf, Theodore,
39 Tremont st., Boston, Mass.
Metz, Abraham L.,
Prytania st., New Orleans, La.
Metzger, George F.,
213 Broad st., Bethlehem, Pa.
Meyer, Christian F. G.,
4th st., and Clark ave., St. Louis, Mo.
Meyer, William V.,
1124 Case ave., Cleveland, O.
Michaelis, Gustavus,
1 Myrtle ave., Albany, N. Y.
Milburn, John A.,
1122 13th st., N. W., Washington, D. C.
Milhau, Edward L.,
183 Broadway, New York, N. Y.
Miller, Adolph W.,
3d & Callowhill sts., Philadelphia, Pa.
Miller, Charles G.,
Nashville. Tenn.
Miller, Jacob A.,
2d & Chestnut sts., Harrisburg, Pa.
Miller, James M.,
Main st., Vacaville, Solano co., Cal.
Miller, Jason A.,
7 N. Main st., Gloversville, N. Y.
Miller, Joseph G.,
10 E. Front st., Plainfield, N. J.
Milligan, Decatur,
509 N. 2d st., Philadelphia, Pa.
Miner, Maurice A.,
2421 Dearborn st., Chicago, Ill.
Miner, Mrs. Mary O.,
Hiawatha, Brown co., Kan.
Mitchell, Edward T.,
Parke, Davis & Co., Detroit, Mich.
Mittelbach, William,
114 Main st., Boonville, Mo.
Miville, Francis C.,
1024 Elm st., Manchester, N.H.
Moffett, Thomas J.,
Edinburg, Ind.
Moffitt, Thomas C.,
2119 Webster st., San Francisco, Cal.
Mohr, Charles,
931 Dauphin st., Mobile, Ala.
Moith, Augustus T.,
1 Ferry st., Fishkill, N. Y.
Molwitz, Ernest,
2707 8th ave., New York, N. Y.
Moody, Richard H..
Main & High sts., Belfast, Me.
Moore, Charles G.,
Eufaula, Indian Territory.

Moore, George,
26 Market st., Somersworth, N. H.
Moore, Joachim B.,
13th & Lombard sts., Philadelphia, Pa.
Moore, John T.,
1012 Rhode Island st., Lawrence, Kan.
Moore, Josh. F.,
4th st., Meridian, Miss.
Moore, Silas H.,
80 4th st., Sioux City, Ia.
More, Arthur J.,
304 Pearl st., Sioux City, Ia.
Morgan, Aylmer L.,
Washington & Adam sts., Camden, Ark.
Morgan, Eugene H.,
Granbury, Hood co., Tex.
Morland, Robert L.,
132 State st., Chicago, Ill.
Morley, William J.,
100 S. 2d st., St. Louis, Mo.
Morris, Lemuel I.,
720 N. Broad st., Philadelphia, Pa.
Morris, William G.,
833 West Lake st., Chicago, I .
Morrison, Joseph E.,
33 Church st., Montreal, Quebec, Can.
Morse, C. Milan,
95 Main st., Nashua, N. H.
Morwessel, Henry,
90 W. 6th st., Covington, Ky.
Moulton, Daniel P.,
213 Lisbon st., Lewistown, Me.
Mowry, Albert D.,
365 Warren st., Boston, Mass.
Mueller, Adolph,
Cherry st., Highland, Ill.
Mueller, Otto E.,
801 E. Madison st., Louisville, Ky
Munson, James H.,
24th & Lombard sts., Philadelphia, Pa.
Munson, Luzerne I.,
Apothecaries' Hall, Waterbury, Conn.
Murphy, John J.,
Pittsfield, Mass.
Myers, Daniel,
111 Water st., Cleveland, O.
Myhre, Olaus G.,
Fox st., Eddy, Eddy co., N. Mex.
Nattans, Arthur,
2d & D sts., N. W., Washington, D. C.
Neathery, James M.,
North side Jefferson st., Van Alstyne, Tex.
Neppach, Stephen A.,
Fruit Vale, Alameda co., Cal.
Newbold, Thomas M.,
608 S. 42d st., Philadelphia, Pa.
Newman, George A.,
5th & Walnut sts., Louisville, Ky.
Newman, George A.,
380 Myrtle ave., Brooklyn, N. Y.
Newton, Philo W.,
142 Asylum st., Hartford, Conn.
Nichols, John C.,
55 State st., New London, Conn.
Nichols, Thomas B.,
178 Essex st, Salem, Mass.
Nicholson, William S.,
Chelam, Washington.
Nipgen, John A.,
Paint & 2d sts., Chillicothe, O.
Nisbet, William W.,
Washington ave., Pittsburgh, Pa.
Noble, William W.,
Berea, Cuyahoga co., O.
Noll, Matthias,
627 Commercial st., Atchison, Kan.
Norton, Edward B.,
2d ave. & 20th st., Birmingham, Ala.
Nowers, Lawrence E.,
Kingston, Sierra co., N. Mex.
O'Hare, James,
6 Benefit st., Providence, R. I.
O'Neil, Henry M.,
463 Hudson st., New York, N. Y.
Oberdeener, Samuel,
Franklin st., Santa Clara, Cal.
Odell, Willis B.,
13 Grant st., Pokeepsie, N. Y.
Ogden, John,
1233 Walnut st., Philadelphia, Pa.
Oglesby, Geo. D.,
Lake ave. & 50th st., Chicago, Ill.
Ohliger, Lewis P.,
23 West Liberty st., Wooster, O.
Oldberg, Oscar,
2421 Dearborn st., Chicago, Ill.
Oleson, Olaf M.,
Fort Dodge, Iowa.
Oliver, William M.,
132 Broad st., Elizabeth, N. J.
Ollif, James H.,
200 Arlington ave., Plainfield, N. J.
Orne, Joel S.,
493 Main st., Cambridgeport, Mass.

Orton, Ingomar F.,
13th st., Galveston, Tex.
Osgood, Hugh H.,
148 Main st., Norwich, Conn.
Osmun, Charles A.,
13 7th ave., New York, N. Y.
Otis, Clark Z.,
63 Court st., Binghamton, N. Y.
Ottinger, James J.,
20th & Spruce sts., Philadelphia, Pa.
Otto, John N. W.,
76 S. Rampart st., New Orleans, La.
Overstreet, William P.,
1624 15th st., Louisville, Ky.
Owens, James A.,
45 Dominick st., Rome, N. Y.
Owens, Richard J.,
Myrtle ave. & Spencer st., Brooklyn, N. Y.
Paine, James D.,
P. O. Box 64, Rochester. N. Y.
Parcher, George A.,
Main st., Ellsworth, Me.
Parisen, George W.,
Smith & High sts., Perth Amboy, N. J.
Parker, Arthur S.,
747 Woodward ave., Detroit, Mich.
Parker, George H.,
Draper's Block, Main st., Andover, Mass.
Parkill, Stanley E.,
Owosso, Shiawassee co., Mich.
Parr, John C.,
Main st., Weston, Mo.
Parrott, John E.,
Kinston, Lenoir co., N. C.
Parsons, John,
194 31st st., Chicago, Ill.
Partridge, Charles K.,
Granite Block, Augusta, Me.
Patch, Edgar L.,
109 Green st., Boston, Mass.
Patten, I. Bartlett,
333 Washington st., Boston, Mass.
Patterson, Theodore H.,
3640 Cottage Grove ave., Chicago, Ill.,
Pattison, Charles H.,
Grand Crossing, Ill.
Pattison, George H.,
7720 Bond ave., Windsor Park, Chicago, Ill.
Patton, John F.,
237 W. Market st., York, Pa.
Patton, Joseph,
Tipton, Ia.
Pauley, Frank C.,
Eastern st. & Compton ave., St. Louis, Mo.
Peabody, William H.,
[illegible] S. Division st., Buffalo, N. Y.
Peacock, Josiah C.,
[illegible] 3909 N. 5th st., Philadelphia, Pa.
Pease, Autumn V.,
Fairburg, Neb.
Pease, Francis M.,
Main st., Lee, Mass.
Peck, George L.,
Hall of Pharmacy, Jamaica, N. Y.
Peniston, Paul,
Palmetto, Ga.
Pennington, T. H. Sands,
14 2d st., Troy, N. Y.
Percy, William G.,
Brainerd, Minn.
Perham, Henry A.,
Main st., Lexington, Mass.
Perkins, Benjamin A.,
16 Pine st., Portland, Me.
Perkins, Charles W.,
297 Main st., New Britain, Conn.
Perkins, William A.,
84 S. C st., Virginia City, Nev.
Perot, T. Morris,
1810 Pine st., Philadelphia, Pa.
Perry, Frederick W. R.,
709 Woodward ave., Detroit, Mich.
Petsche, Bismarck W.,
Arlington Chemical co., Yonkers, N. Y.
PETTIT, HENRY M.,
Carrollton, Mo.
Peyton, Robert D.,
1317 7th ave., Louisville, Ky.
Pfafflin, Henry A.,
402 S. Delaware st., Indianapolis, Ind.
Pfeiffer, John,
241 Nostrand ave., Brooklyn, N. Y.
Pfingst, Edward C.,
3d & Breckenridge sts., Louisville, Ky.
PFINGST, FERDINAND J.,
18th & Main sts., Louisville, Ky.
Pfingsten, Gustav,
6 Whitehall st., New York, N. Y.
Pfunder, William,
1st & Ash sts., Portland, Oregon.
Phelps, Dwight,
337 Main st., West Winsted, Conn.
Phillips, Charles W.,
484 Eastern ave., Cincinnati, O.

Phillips, Edwin F.,
4 E. Main st., Armada, Mich.
Physick, Henry S.,
3104 Easton ave., St. Louis, Mo.
Pickett, John H.,
Oskaloosa, Mahaska co., Iowa.
Pieck, Edward L.,
6th & Main sts., Covington, Ky.
Pierce, William H.,
316 Shawmut ave., Boston, Mass.
Pile, Gustavus,
770 Passyunk ave., Philadelphia, Pa.
Pitt, John R.,
218 Main st., Middletown, Conn.
Pleasants, Charles H.,
61 West Houston st., New York, N. Y.
Plummer, David G.,
6 Main st., Bradford, Stark county, Ill.
Plummer, Edward,
1300 Broadway, New York, N. Y.
Plummer, Joseph W.,
504 Simonton st., Key West, Fla.
Poehner, Adolph A.,
1234 Columbia ave., Philadelphia, Pa.
Porter, Chilton S.,
Somerset, Puluski co., Ky.
Porter, Henry C.,
Main & Pine sts., Towanda, Pa.
Porter, Louis F.,
151 Winsor st., Cambridgeport, Mass.
Porter, Martin L.,
Danforth, Washington co., Me.
Porter, Millett N.,
3850 State st., Chicago, Ill.
Potts, David G.,
24 S. 2d st., Philadelphia, Pa.
Powell, Robert B.,
2d & G sts., Eureka, Humboldt Bay, Cal.
Powell, Thomas W.,
10 Houston st., Fort Worth, Tex.
Power, Frederick B.,
24 Grove Terrace, Passaic, N. J.
Prall, Delbert E.,
111 S. Jefferson st., East Saginaw, Mich.
Preissler, H. W.,
Shelbyville, Ky.
Prentice, Fred. F.,
Opposite Post Office, Janesville, Wis.
Prescott, Albert B.,
University of Michigan, Ann Arbor, Mich.
Presco Horace A.,
360 Washington st., Boston, Mass.
Preston, Andrew P.,
2 Congress Block, Portsmouth, N.H.
Preston, David,
9th & Lombard sts., Philadelphia, Pa.
Price, Charles H.,
Welton & Pierpont sts., Denver, Col.
Price, Charles H.,
226 Essex st., Salem, Mass.
Price, Joseph,
226 Essex st., Salem, Mass.
Prieson, Adolph,
Maln & Vesper sts., Lock Haven, Pa.
Probeck, George J.,
223 Detroit st., Cleveland, O.
Proctor, Wallace,
1900 Pine st., Philadelphia, Pa.
Puckner, William A.,
92 22nd st., Chicago, Ill.
Punch, William F.,
71 Dauphin st., Mobile, Ala.
Purcell, Nicholas S.,
King st., Leesburgh, Va.
Pursell, Howard,
Mill & Cedar sts., Bristol, Pa.
Pyle, Cyrus,
88 Warren st., New York, N. Y.
Quackinbush, Benjamin F.,
703 Greenwich st., New York, N. Y.
Qvale, Victor A.,
Rochester, Minn,
Rademaker, Herman H.,
801 E. Madison st., Louisville, Ky.
Radford, Reuben L.,
129 Main st., Henderson, Ky.
Ramsperger, Gustavus.
236 E. 23d st., New York, N. Y.
Rand, Daniel M.,
Main & Depot sts., S. Windham, Me.
Randall, Frank O.,
101 N. Main st., Brockton, Mass.
Rano, Charles O.,
1872 Niagara st., Buffalo, N. Y.
Rapelye, Charles A.,
325 Main st., Hartford, Conn.
Ray, Frederick E.,
901 K st., Sacramento, Cal.
Ray, Peter W.,
379 S. 2d st., Brooklyn, N. Y.
Raymond, Harry L.,
833 Massachusetts st., Lawrence, Kan.
Raynale, Frank B.,
Residence unknown.

Redsecker, Jacob H.,
810 Cumberland st., Lebanon, Pa.
Reed, Charles C.,
111 Kickosoo st., Lincoln, Ill.
Reed, James,
302 S. 6th st., Nebraska City, Neb.
Reed, Willoughby H.,
Marshall & Astor sts., Norristown, Pa.
Reichardt, F. Alfred,
Residence unknown.
REMINGTON, JOSEPH P.,
1832 Pine st., Philadelphia, Pa.
Renz, Frederick J.,
Market & Floyd sts., Louisville, Ky.
Reynolds, Charles E.,
U. S. Rec'g Ship Vermont, Brooklyn, N. Y.
Reynolds, Howard P.,
Park & North aves., Plainfield, N. J.
Reynolds, John J.,
Water & Main Cross sts., Flemingsburg, Ky.
Reynolds, William K.,
354 Friendship st., Providence, R. I.
Rhoades, Stephen H.,
23 N. Main st., Pittston, Pa.
Rhode, Rudolph E.,
504 N. Clark st., Chicago, Ill.
Rice, Charles,
Bellevue Hospital, New York, N. Y.
Rich, Willis S.,
Fairport, Monroe co., N. Y.
Richardson, Horatio S.,
Main st., Concord, Mass.
Richter, Gustave A.,
801 S. Front st., Philadelphia, Pa.
Riddell, Benjamin F.,
8 Granite Block, Fall River, Mass.
Ridgway, Lemuel A.,
Versailles, Conn.
Riesenman, Joseph,
1266 Liberty st., Franklin, Pa.
Riggs, William E.,
Fairfield, Clay co., Neb.
Riley, Charles W.,
1343 N. 13th st., Philadelphia, Pa.
Rittenhouse, Henry N.,
1705 N 17th st., Philadelphia, Pa.
Rives, Edward B.,
56 N. Main st., Los Angeles, Cal.
Robbins, Alonzo,
11th & Vine sts., Philadelphia, Pa.
Robert, William H., Jr.,
431 W. Main st., Denison, Tex.
Roberts, Daniel J.,
Peabody, Marion co., Kan.
Roberts, William,
Fort Meyer, Va., P. O. Washington, D. C.
Robertson, Felix O.,
Searcy, White co., Ark.
Robin, Oscar,
249 St. Ann st., New Orleans, La.
Robins, Wilbur F.,
28 Main st., Littleton, N. H.
Robinson, Edward A.,
19 Warwick st., Lowell, Mass.
Robinson, Ernest F.,
832 Young st., Toronto, Ont., Can.
ROBINSON, JAMES S.,
2d & Madison sts., Memphis, Tenn.
Robinson, William A.,
49 Drummond st., Auburn, Me.
Rockefeller, Lucius,
Palisade ave., Englewood, N. J.
Rogers, Arthur H.,
Geneseo, Livingston co., N. Y.
Rogers, Wiley,
15th & Chestnut sts., Louisville, Ky.
Rogers, William H.,
North st., Middletown, N. Y.
Rohde, Claus F.,
Owatonna, Minn.
Rollins, John F.,
Fort George, Duval co., Fla.
ROSENGARTEN, MITCHELL G.,
17th & Fitzwater sts., Philadelphia, Pa.
Rosewater, Nathan,
111 Water st., Cleveland, O.
Ross, Samuel P.,
Liberty ave. & McKee st., Houston, Tex.
Rowlinski, Robert A.,
104 Broughton st., Savannah, Ga.
Rudolf, Eliza,
Dryades & 2d sts., New Orleans, La.
Ruenzel, Henry G.,
753 3d st., Milwaukee, Wis.
Ruete, Theodore W.,
568 Main st., Dubuque, Iowa.
Rumsey, Samuel L.,
Residence unknown.
Runyon, Edward W.,
234 Sutter st., San Francisco, Cal.
Ruppert, John,
Pine Hill, Cincinnati, O.
Rusby, Henry H.,
222 W. 132d st., New York, N. Y

Russell, Eugene J.,
Army st. & Canton ave., Baltimore, Md.
Rust, William,
7 Peace st., New Brunswick, N. J.
Ryan, Frank G.,
145 N. 10th st., Philadelphia, Pa.
Ryan, Henry,
Taftville, Conn.
Ryerson, Henry O.,
5 Main st., Newton, N. J.
Sadtler, Samuel P.,
204 N. 34th st., Philadelphia, Pa.
SANDER, ENNO,
129 S. 11th st., St. Louis, Mo.
Sanderson, Stephen F.,
828 Nicollet ave., Minneapolis, Minn.
Sargent, Ezekiel H.,
125 State st., Chicago, Ill.
Sargent, Jesse W.,
252 Pleasant st., Malden, Mass.
Sauer, Louis W.,
927 Central ave., Cincinnati, O.
Sauerhering, Rudolph A.,
Main st., Mayville, Dodge co., Wis.
Saunders, William,
Central Experim. Farm, Ottawa, Ont., Can.
Sautter, Louis,
S. Pearl & Plain sts., Albany, N. Y.
Sawyerl Willey W.,
426 E. State st., Rockford, Ill.
Sawyer, William F.,
1152 Tremont st., Boston, Mass.
Sayre, Edward A.,
Seabury & Johnson, New York, N. Y.
Sayre, Lucius E.,
University of Kansas, Lawrence, Kan.
Sayre, William H.,
Warner & Orange sts., Newark, N. J.
Schaap, John,
618 Garrison ave., Fort Smith, Ark.
Schafer, George H.,
713 Front st., Fort Madison, Iowa.
Schafhirt, Adolph J.,
1st & H sts., Washington, D. C.
Scheffer, Emil,
173 Shelby st., Louisville, Ky.
Scheffer, Henry W.,
Care of Larkin & Scheffer, St. Louis, Mo.
Schellentrager, E. A.,
725 St. Clair st., Cleveland, O.
Scherer, Andrew,
381 E. Division st., Chicago, Ill.
Scherff, John P.,
Glenwood & Wash'tn aves., Bloomfield, N. J.
Scherling, Gustav,
1201 4th st., Sioux City, Ia.
Schieffelin, William J.,
170 William st., New York, N. Y.
Schiemann, Edward B.,
M & Walnut sts., Louisville, Ky.
Schlaepfer, Henry J.,
Main & 2d sts., Evansville, Ind.
Schley, Steiner,
16 W. Patrick st., Frederick City, Md.
Schlotterbeck, Julius O.,
17 S. Ingalls st., Ann Arbor, Mich.
Schmid, Henry,
38 Ave. A, New York, N. Y.
Schmidt, Ferdinand T.,
Residence unknown.
Schmidt, Florian C.,
71st st. & Cottage Grove ave., Chicago, Ill.
Schmidt, Frederick M.,
1107 Schiller Building, Chicago, Ill.
Schmidt, Valentine,
Polk & Jackson sts., San Francisco, Cal.
Schmitt, Carl,
1871 Pearl st., Brooklyn Village, O.
Schmitt, George J. F.,
507 W. Commerce st., San Antonio, Tex.
Schmitt, Joseph M.,
312 North ave., Rochester, N. Y.
Schmitter, Jonathan,
Maple st., Gypsum City, Saline co., Kan.
Schoenhut, Christie H.,
199 Superior st., Cleveland, O.
Schoettlin, Albert J.,
4th & Chestnut sts., Louisville, Ky.
Scholtz, Edmund L.,
16th & Stout sts., Denver, Col.
Schotel, John C.,
Railroad ave., Gloster, Amite co., Miss.
Schrader, Herman v. R.,
Tallahassee, Fla.
Schrank, C. Henry,
437 E. Water st., Milwaukee, Wis.
Schreck, Leo S.,
Liberty & John sts., Cincinnati, O.
Schueller, Ernst,
281 S. High st., Columbus, O.
Schueller, Frederick W.,
232 S. High st., Columbus, O.
Schulze, Louis,
631 S. Patterson Park ave., Baltimore, Md

Schumann, Theodore,
Whitehall & Hunter sts., Atlanta, Ga.
Schurk, Louis,
3201 Olive st., St. Louis, Mo.
Schwab, Leslie W.,
460 E. 41st st., Chicago, Ill.
Schweickhardt, Richard,
Main & Ervay sts., Dallas, Tex.
Scott, Alex. W.,
Mountain ave., Fort Collins, Col.
Scott, Frank G.,
36 Euclid ave., Cleveland, O.
Scott, George T.,
Franklin Square, Worcester, Mass.
Scott, J. McDonald,
381 W. Van Buren st., Chicago, Ill.
Scott, William H.,
1617 17th st., Richmond, Va.
Scoville, Charles H.,
Opp. the Lock, Tonawanda, Erie co., N. Y.
Scoville, Wilbur L.,
St. Botolph & Garrison sts., Boston, Mass.
SEABURY, GEORGE J.,
59 Maiden Lane, New York, N. Y.
Searby, William M.,
859 Market st., San Francisco, Cal.
Sedberry, Bond E.,
Market Square, Fayetteville, N. C.
Seeman, Charles F.,
513 Royal st., New Orleans, La.
Seifert, Charles A.,
German Hospital, San Francisco, Cal.
Seitz, Oscar,
104 N. Santa Fe ave., Salina, Kan.
Selzer, Eugene R.,
1021 Superior st., Cleveland, O.
Sempill, Walter M.,
135 Clark st., Chicago, Ill.
Sennewald, Ferdinand W.,
800 Hickory st., St. Louis, Mo.
Serodino, Herman,
53 Observatory st., Cincinnati, O.
Sevin, N. Douglas,
141 Main st., Norwich, Conn.
Shafer, Erwin C.,
819 Spring Garden st., Philadelphia, Pa.
Shake, Homer C.,
125 Oliver ave., W. Indianapolis, Ind.
Shannon, Thomas R.,
143 Trumbull st., Hartford, Conn.
Sharp, Alpheus P.,
Pratt & Howard sts., Baltimore, Md.
Sharp, Harry,
Junc. Marietta & Walton sts., Atlanta, Ga.
Sharples, Stephen P.,
13 Broad st., Boston, Mass.
Shaw, Robert J.,
3 E. Front st., Plainfield, N. J.
Shell, James L.,
Aberdeen, Miss
Shelton, William A.,
Kansas & Howel av's, Marceline, Linn co, Mo.
Shelton, William C.,
Jerome st., Big Stone Gap, Va.
SHEPPARD, SAMUEL A. D.,
1129 Washington st., Boston, Mass.
Sherman, Charles R.,
1513 Dodge st., Omaha, Neb.
Sherrard, Charles C.,
121 20th st., Detroit, Mich.
Sherwin, Eugene A.,
29 Stark st., Portland, Ore.
Sherwood, Louis W.,
45 W. Broad st., Columbus, O.
Shinn, James T.,
Broad & Spruce sts., Philadelphia, Pa.
Shoemaker, Richard M.,
4th & Race sts., Philadelphia, Pa.
Shreve, John A.,
Main st., Port Gibson, Miss.
Shriver, Henry,
53 Baltimore st., Cumberland, Md.
Shryer, Thomas W.,
111 Baltimore st., Cumberland, Md.
Shultz, Merriken E.,
106 N. 5th st., Beatrice, Neb.
Shurtleff, Israel H.,
39 Elm st., New Bedford, Mass.
Siegemund, Charles A.,
Boston, Mass.
Siegenthaler, Harvey N.,
22 E. High st., Springfield, O.
Sieker, Ferdinand A.,
128 William st., New York, N. Y.
Siekman, Ivan F.,
75 S. Rampart st., New Orleans, La.
Simmon, Karl,
7th & Sibley sts., St. Paul, Minn.
Simms, Giles G. C.,
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Simon, William,
1348 Block st., Baltimore, Md.
Simons, Arthur H.,
Conneaut, Ashtabula co., O.

Simonson, William,
9th & Race sts., Cincinnati, O.
Simpson, Robert,
Hillsboro & Salisbury sts., Raleigh, N. C.
Simpson, William,
101 Fayetteville st., Raleigh, N. C.
Simson, Francis C.,
Prentagon Bdg., Halifax, N. Sco., Can.
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Slater, Frank H.,
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Sleuman, Charles A.,
159 Lamartine st., Jamaica Pl.,Boston, Mass.
Sloan, George W.,
22 W. Washington st., Indianapolis, Ind.
Slocum, Frank L.,
170 Rebecca st., Allegheny, Pa.
Smink, Robert W.,
324 W. Spence st., Shamokin, Pa.
Smink, William H. R.,
33 Market st., Shamokin, Pa.
Smith, Amasa D.,
142 Merrimack st., Manchester, N. H.
Smith, B. Frank,
2600 Indiana ave., Chicago, Ill.
Smith, Charles B.,
861 Broad st., Newark, N. J.
Smith, Clarence P.,
863 Broad st., Newark, N. J.
Smith, Edward N.,
95 Main st.,Thompsonville, Hartf.co., Conn.
Smith, Edward S.,
Main st., Port Henry, N. Y.
Smith, Frank R.,
5th & King sts., Wilmington, Del.
Smith, George S.,
Liberal, Seward co., Kan.
Smith, J. Hungerford,
19 Elm st., Rochester, N. Y.
Smith, John C.,
65 Margaret st., Plattsburgh, N. Y.
Smith, Joseph S.,
Akron, O.
Smith, Lauriston S.,
King st., St. Augustine, Fla.
Smith, Linton,
Church & Bennett sts., Wilmington, Del.
Smith, Linville H.,
701 Centre st., Jamaica Pl., Boston, Mass.
Smith, Reuben R.,
198 9th ave., New York, N, Y.
Smith, Samuel W.,
182 Main st., Ansonia, New Haven co.,Conn.
Smith, Theodric,
1343 Pennsylvania ave., Baltimore, Md.
Smith, Whitefoord G.,
31 Patton ave., Asheville, N. C.
Smith, Willard A.,
Main st., Richfield Springs, N. Y.
Smith, William C.,
14th& Market sts.,Oakland,Alameda co.,Cal.
Smithson, David E.,
Caldwell, Ada co., Idaho.
Sniteman, Charles C.,
Neillsville, Clark co., Wis.
Snow, Charles W.,
214 Warren st., Syracuse, N. Y.
Snow, Herbert W.,
15th & Farnam sts., Omaha, Neb.
Snyder, Alva L.,
33 Court Square, Bryan, O.
Snyder, Ambrose C.,
13½ St. Felix st., Brooklyn, N. Y.
Snyder, Robert J.,
2d & Market sts., Louisville, Ky.
Soetje, Edward C.,
434 South Broadway, South Denver, Col.
Sohn, Frank,
Grand & Easton aves., St. Louis, Mo.
Sohrbeck, G. Henry,
3d ave. & 16th st., Moline, Ill.
Sombart, John E.,
Wilmore, Kan.
Sords, Thomas V.,
315 Pearl st., Cleveland, O.
Spalding, Warren A.,
19 Church st., New Haven, Conn.
Spangler, H. W.,
Perry, Jefferson co., Kan.
Spengler, John G.,
2d & Webster sts., Dayton, O.
Spenzer, Peter I.,
370 Central ave., Cleveland. O.
Sperry, Herman J.,
151 Chapel st., New Haven, Conn.
Squibb, Edward H.,
36 Doughty st., Brooklyn, N. Y.
Squibb, Edward R.,
36 Doughty st., Brooklyn, N. Y.

Squires, George B.,
109 Green st., Boston, Mass.
Stacey, Benjamin F.,
Thompson Square, Charlestown, Mass.
Staebler, Richard,
848 Broad st., Newark, N. J.
Stahler, William,
Main & Swedes sts., Norristown, Pa.
Stahlhuth, Ernst H. W.,
5th & Washington sts., Columbus, Ind.
Stam, Colin F.,
Chestertown, Kent co., Md.
Stamford, William H.,
256 Mulberry st., Newark, N. J.
Stanley, Edgar C.,
97 Franklin st., Auburn, N. Y.
Staudt, Louis C.,
15 S. Broadway, Aurora, Ill.
Stearns, Henry A.,
Care of Fred Stearns & Co., Detroit, Mich.
Stebbins, Harry F.,
Cor. Willow & 23d sts., Denver, Col.
Stedem, Frederick W. E.,
Broad st. & Fairmount ave., Philadelphia, Pa.
Steele, George R.,
Main & Prospect sts., Thompsonville, Conn.
Steele, James G.,
635 Market st., San Francisco, Cal.
Stein, Jacob H.,
801 Penn st., Reading, Pa.
Steinhauer, Frederick,
1539 Larimer st., Denver, Col.
Stendel, Guthardt,
640 Dryades st., New Orleans, La.
Stevens, Alonzo B.,
15 Church st., Ann Arbor, Mich.
Stevens, Fred. D.,
133 Woodward ave., Detroit, Mich.
Stevens, Luther F.,
141 Baltic st., Brooklyn, N. Y.
St. Martin, Theophilus,
Wahoo, Neb.
Stoff, Louis,
1180 2d ave., New York, N. Y.
Stone, Clarence G.,
580 Lafayette ave., Detroit, Mich.
Stork, Harry,
2108 Lucas pl., St. Louis, Mo.
Stoughton, Dwight G.,
104 State st., Hartford, Conn.
Stowell, Daniel,
1045 Washington st., Boston, Mass.
Strathman, Charles A.,
El Paso, Woodford co., Ill.
Summers, James W. F.,
Gould City, Mackinaw co., Mich.
Sumner, Alphonso,
51 Huntington ave., Boston, Mass.
Sweeny, Robert O.,
Duluth, St. Louis co., Minn.
Sweet, Caldwell,
22 W. Market Square, Bangor, Me.
Tailby, Joseph A.,
Linden st., Wellesley, Mass.
Tartiss, Alfred J.,
39 Johnston st., Newburg, N. Y.
Tanke, Ernest J.,
117 Wells st., Chicago, Ill.
Taylor, Alfred B.,
2538 N. 6th st., Philadelphia, Pa.
Taylor, George A.,
42 Railroad st., Methuen, Mass.
Taylor, John P.,
99 3d st., New Bedford, Mass.
Taylor, Thomas L.,
Custer ave., Custer City, S. Dak.
Taylor, Walter T.,
709 Dauphine st., New Orleans, La.
Thatcher, Hervey D.,
12 Market Square, Potsdam, N. Y.
Thomas, Oscar E.,
164 Main st., Columbia, S. C.
Thomas, Robert, Jr.,
126 Broadway, Thomasville, Ga.
Thomasson, Anders,
277 Central st., Lowell, Mass.
Thompson, Frank A.,
Care of Parke, Davis & Co., Detroit, Mich.
Thompson, William B.,
4804 Trinity Place, W. Philadelphia, Pa.
Thompson, William S.,
703 15th st., Washington, D. C.
Thompson, William S.,
717 E. Baltimore st., Baltimore, Md.
Thomsen, John J., Jr.,
16 W. German st., Baltimore, Md.
Thorn, Henry P.,
Main st., Medford, N. J.
Thurber, Almond R.,
648 S. Pennsylvania ave., S. Denver, Col.
Thurston, Azor,
Grand Rapids, Wood co., O.
Tiarks, Hermann,
First st., Monticello, Ia.

Tigner, James O.,
Greenville, Meriwether co., Ga.
Tilden, Amos K.,
31 School st., Boston, Mass.
Tobey, Charles W.,
302 Market st., Troy, O.
Tobin, John M.,
Narragansett Pier, R. I.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Tomfohrde, Charles W.,
1827 Case ave., St. Louis, Mo.
Tomfohrde, John W.,
Benton & 22d sts., St. Louis, Mo.
Topley, James,
166 Georgia st., Vallejo, Solano co., Cal.
Torbert, Willard H.,
756 Main st., Dubuque, Ia.
Tracy, David W.,
139 Main st., Hartford, Conn.
Trautmann, Ludwig,
Wabasha, Minn.
Travis, J. Walton,
59 Fairfield ave., Bridgeport, Conn.
Travis, Miles B.,
Saybrook, McLean co., Ill.
Treat, Joseph A.,
Stuart, Guthrie co., Ia.
Trimble, Henry,
145 N. 10th st., Philadelphia, Pa.
Troppmann, Charles M.,
300 6th st., San Francisco, Cal.
Truax, Charles,
81 Randolph st., Chicago, Ill.
Trudel, Jacques J.,
60 Friend st., Amesbury, Mass.
Tscheppe, Adolph,
1010 4th ave., New York, N. Y.
Tucker, Greenleaf R.,
Boston City Hospital, Boston, Mass.
Tucker, Mosely F.,
Dauphin & Hamilton sts., Mobile, Ala.
Tufts, Charles A.,
85 Washington st., Dover, N. H.
Tuma, Bruno,
11 Camp st., New Orleans, La.
Turner, George H.,
296 S. Pearl st., Albany, N. Y.
Turner, Isaac W.,
92 Bowery, Palma House, New York, N. Y.
Turner, T. Larkin,
North Weymouth, Mass.
Turrell, Judson W.,
Longmont, Col.
Tyner, Charles O.,
Marietta & Broad sts., Atlanta, Ga.
Uhlich, Ferdinand G.,
1401 Salisbury st., St. Louis, Mo.
Upson, Rosa,
Marshalltown, Marshall co., Ia.
Urban, Jacob P.,
60 Ontario st., Cleveland, O.
Valliant, George E.,
720 Main st., Pine Bluff, Ark.
Van Antwerp, Andrew,
Dauphin & Royal sts., Mobile, Ala.
Van Antwerp, Garet,
71 Dauphin st., Mobile, Ala.
Van Auken, Jerrie A.,
125 Main st,, Gloversville, N. Y.
Van Winkle, Abraham W.,
35 Clinton ave., Newark, N. J.
Vargas-Heredia, Jorge,
474 Columbus ave., Boston, Mass.
Varney, Edward F.,
39 Tremont st., Boston, Mass.
Vaughan, Parry W.,
Main st., Durham, Orange co., N. C.
Vernor, James,
235 Woodward ave., Detroit, Mich.
Viallon, Paul L.,
Park & Front sts., Bayou Goula, La.
Vilter, Hermann T.,
76 McMicken ave., Cincinnati, O.
Vockroth, Emil,
79 Newark ave., Jersey City, N. J.
Voge, Richard,
260 S. Halsted st., Chicago, Ill.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
Vordick, August H.,
Jefferson ave. & Benton st., St. Louis, Mo.
Voss, George W.,
680 Woodland ave., Cleveland, O.
Wagner, Henry,
9th & Linn sts., Cincinnati, O.
Wagner, William I.,
Jackson, Ga.
Wakefield, Seth D.,
114 Lisbon st., Lewiston, Me.
Walbrach, Arthur,
1414 15th st., Denver, Col.
Walker, Joel P.,
Dooly st., Montezuma, Ga.

Walker, Charles W.,
171 E. Haverhill st., Lawrence, Mass.
Walker, John P.,
Main st., Freehold, N. J.
Walker, William I.,
74 State st., Albany, N. Y.
Wall, Otto A.,
2111 Columbus st., St. Louis, Mo.
Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
Ward, A. Jae,
Adel, Ia.
Ward, Charles A.,
P. O. Box 460, Stoneham, Mass.
Ward, George J.,
Front st., St. Clair City, Mich.
Wardell, Robert C.,
Residence unknown.
Warn, William E.,
1st st, Keyport, N. J.
Warner, William R.,
1228 Market st., Philadelphia, Pa.
Warren, Edwin A.,
400 Sibley st., St. Paul, Minn.
Warren, William M.,
210 E. Congress st., Detroit, Mich.
Washburn, Harry M.,
823 Kansas ave., Topeka, Kan.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Sidney P.,
Atlanta, Ga.
Watson, William S.,
25 Peachtree st., Atlanta, Ga.
Waugh, George J.,
Ontario st., Stanford, Ont., Can.
Wearn, William H.,
Trade & Tryon sts., Charlotte, N. C.
Weaver, John A.,
332 Northampton st., Easton, Pa.
Webb, William H.,
556 N. 16th st., Philadelphia, Pa.
Webber, J. Le Roy,
Care of Sharp & Dohme, Baltimore, Md.
Weber, Herman A.,
Stewartsville, De Kalb Co. Mo.
Weber, John H.,
Main st., Cascade, Ia.
Weeks, B. Frank,
Rooms 32 Johnston Bld., care B. S. Weeks,
Cincinnati, O.
Wehrly, Thomas M.,
3d & H sts., N. E., Washington, D. C.
Weidemann, Charles A.,
2148 Green st., Philadelphia, Pa.
Weihe, Otto A.,
640 Post st., San Francisco, Cal.
Weinman, Oscar C.,
173 7th ave., New York, N. Y.
Weiser, Emilius I.,
5 Water st., Decorah, Ia.
Wells, Chas. H.,
Main & 6th sts., Pueblo, Col.
Wellcome, Henry S.,
8 Snow Hill, London, England.
Wells, Edwin H.,
450 Boylston st., Boston, Mass.
Wendell, Henry E.,
3d & George sts., Philadelphia, Pa.
Wenzell, William T.,
201 Polk st., San Francisco, Cal.
Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
West, Charles A.,
99 Broad st., Boston, Mass.
Westcott, James W.,
421 N. Charles st., Baltimore, Md.
Westmann, F. H.,
2744 Cass ave., St. Louis, Mo.
Wetherell, Albert S.,
122 Water st., Exeter, N. H.
Wetterstroem, Albert,
435 Colerain ave., Cincinnati, O.
Weyer, John,
Norwood, Hamilton co., O.
Whall, Joseph S.,
82 Hancock st., Quincy, Mass.
Wheat, Eli M.,
Broad st., Columbus, Ga.
Wheeler, C. Gilbert,
143 Lake st., Chicago, Ill.
Wheeler, William D.,
W. Chester Park & Beacon st., Boston, Mass.
Whelpley, Henry M.,
2342 Albion Place, St. Louis, Mo.
Whitcomb, Frederick E.,
Broadway & Olive sts., St. Louis, Mo.
White, Aaron S.,
59 High st., Mt. Holly, N. J.
White, George H.,
Newark & Jersey aves., Jersey City, N. J.
White, Richard E.,
400 Hayes st., San Francisco, Cal.
White, William H.,
2320 4th st., Meridian, Miss.

WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
Whiting, Frederick T.,
Main st., Great Barrington, Mass.
Whitman, Nelson S.,
175 Main st., Nashua, N. H.
WHITNEY, HENRY M.,
297 Essex st., Lawrence, Mass.
Wichelns, Frederick,
192 Greenwich st., New York, N. Y.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Weigan, Thomas S.,
145 N. 10th st., Philadelphia, Pa.
Wienges, Conrad,
489 Jersey ave., Jersey City, N. J.
Wight, Oscar M.,
Lexington st., Independence, Mo.
Wilcox, Frederick,
Apothecaries' Hall, Waterbury, Conn.
Wilhite, Frank T.,
39 Public Square, Anderson, S. C.
Wilder, George P.,
N. Park st., Lebanon, N. H.
Willet, G. Howard,
725 Main st., Kansas City, Mo.
Williams, Benjamin C.,
Wilson, St. Croix co., Wis.
Williams, Charles F.,
Main st., Thomaston, Conn.
Williams, Duane B.,
16 Lincoln Square, Worcester, Mass.
Williams, Edward M.,
Myers, Lee co., Fla.
Williams, George G.,
P. O. Box 3551, Boston, Mass.
Williams, John K.,
391 Main st., Hartford, Conn.
Williams, Richard W.,
Notre Dame st., Three Rivers, Quebec, Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williams, Williams H.,
659 Main st., Wheeling, W. Va.
Willis, John B.,
Waverly, Ala.
Wills, Fred. M.,
323 Main st., Charlottesville, Va.
Wilson, Benjamin O.,
28 Merchants' Row, Boston, Mass.
Wilson, Charles F.,
2841 Gamble st., St. Louis, Mo.
Wilson, Frank M.,
133 Main st., Williamantic, Conn.
Wilson, William,
106 Broadway, New York, N. Y.
WINKELMANN, JOHN H.,
Liberty & German sts., Baltimore, Md.
Winnberg, John M.,
200 Main st., Jamestown, N. Y.
WINTER, JONAS,
202 Prospect st., Hagerstown, Md.
Winters, John H.,
New Canaan, Conn.
Wolfe, Nathaniel,
Wilkes-Barre, Pa.
WOLTERSDORF, LOUIS,
171 Blue Island ave, Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, Edward S.,
14 Chauncey st., Cambridge, Mass.
Woodman, Walter I.,
St. Augustine, Fla.
Wood, George M.,
20 Broad st., Bloomfield, N. J.
Wood, James P.,
2 Church st., New Haven, Conn.
Wood, Mason B.,
P. O. Box 58, East Providence, R. I.
Woodruff, Roderick S.,
91 Blank st., Waterbury, Conn.
Wood, Silas E.,
Jackson, Mo.
Wooldridge, Daniel T.,
9 Morgan st.. Boonville, Mo.
Woolley, Stephen D.,
Asbury Park, N. J.
Wooten, Thos. V.,
943 W. Madison st., Chicago, Ill.
Wray, George B.,
P. O. Box 721, Yonkers, N. Y.
Wright, Albert F.,
1355 Washington st., West Newton, Mass.
Wright, Edward E.,
82 Maxfield st., New Bedford, Mass.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
396 Dryades st., New Orleans, La.
Wurmb, Theodore H.,
1923 E. Grand ave., St. Louis, Mo.
Yeager, Alvin A.,
134 Gay st., Knoxville, Tenn.

Yocum, Albert L.,
Chariton, Lucas co., Ia.
YORKSTON, MATTHEW M.,
429 Central ave., Cincinnati, O.
Young, John K.,
P. O. Box 235, Bristol, Pa.
Youngs, William,
114 Park ave., Rich Hill, Mo.
Zahn, Emil A.,
1801 State st., Chicago, Ill.
ZEILIN, J. HENRY,
306 Cherry st., Philadelphia, Pa.
Zellhoefer, George,
1044 Broadway, Brooklyn, N. Y.
Ziegler, Philip M.,
526 Penn st., Reading, Pa.
Zimmer, Harry E.,
78 E. Washington st., Indianapolis, Ind.
Zimmerman, Charles,
423 S. Adams st., Peoria, Ill.
Zimmermann, Albert,
2113 S. Adams st., Peoria, Ill.
Zoeller, Edward V.,
Main st., Tarboro, N. C.
Zuenkeler, J. Fred.,
686 Vine st., Cincinnati, O.
Zwick, George A.,
11th st. & Madison ave., Covington, Ky.

LIST OF RESIGNATIONS.

Abbott, Louis L.
Bacon, Gaston E.
Beckett, Frederick A.
Bissell, John G.
Blocki, William F.
Bostick, Elmer E.
Bower, Henry A.
Brackett, Aurick S.
Brewster, Wadsworth J.
Buckner, John A.
Chapa, Francisco A.
Choate, John
Cluverius, Wat T.
Cook, Frank L.
Craig, John W.
Craighill, Edward A.
Dunning, Lyman T.
Earl, Charles.
Eccles, Mary H.
Edwards, William F.
Fechter, Arthur E.
Finley, Norval H.
Gallagher, John A.
Gibson, John S.
Gray, William H.
Green, Arthur L.
Gurney, Charles H.
Haass, G. Herman.
Hayhurst, Susan.
Hoffman, Otto L.
Hubbard, John H.
Hughes, Albert E.
Jacobs, Fred. L.
Jordan, Francis.
Kostitch, Stephen T.
Maclise, James.
Mendoza, Francis F.
Patton, John E.
Preston, Calvin W.
Ricksecker, Theodore.
Sayre, Eugene A.
Smith, Henry A.
Spofford, Charles B.
Starr, Thomas.
Storck, Jacob A.
Strater, Henry H.
Thompson, James H.
Van Patten, William J.
Vogt, John G.
Walker, Anselle.
Weber, Eugene.
Welch, Willard C., Jr.
Wharton, John C.

LIST OF DECEASED MEMBERS.

Borrell, Godfrey,	New Orleans, La.,	Elected 1891
Bristol, Charles E.,	Ansonia, Conn.,	" 1880
Butler, P. H.,	Vernal, Utah,	" 1892
Dick, Dundas,	New York, N. Y.,	" 1879
Dyche, David R.,	Chicago,	" 1892
Fox, Daniel S.,	Reading, Pa.,	" 1872
Gaylord, Henry C.,	Cleveland, O.,	" 1869
Goodrich, Stephen,	Hartford, Conn.,	" 1875

Hoskinson, J. Thomas, Jr.,	Philadelphia, Pa.,	Elected 1881
Howson, Walter H.,	Chillicothe, O.,	" 1875
Johnson, John,	New Orleans, La.,	" 1887
Jones, Daniel S.,	Philadelphia, Pa.,	" 1859
Kidder, Samuel,	Lowell, Mass.,	" 1859
Maisch, John M.,	Philadelphia, Pa.,	" 1856
O'Brien, James J.,	Boston,	" 1875
Perkins, Elisha H.,	Baltimore. Md.,	" 1857
Scribner, John C.,	Angels Camp, Cal.,	" 1889
Shiels, George E.,	New York,	" 1860
Venrard, William L.,	New York, N. Y.,	" 1888
Walton, Joseph R.,	Washington, D. C.,	" 1883

LIST OF MEMBERS DROPPED FROM THE ROLL, IN COMPLIANCE WITH CHAPTER VIII., ARTICLE III., OF THE BY-LAWS.

(SEE VOLUME 40, PAGE 50, MINUTES OF THE COUNCIL.)

Barnum, Joseph P.
Beck, Charles.
Beetem, Jacob S.
Bradley, James W.
Brant, Edmund W.
Church, Howard M.
Conger, Frederic A.
Curtis, Charles G.
Day, Charles E.
Dudley, Oscar E.
Erwin, James J.
Finnerty, Edward J., Jr.
Forsyth, James.
Gooding, Robert J.
Hodgkins, Israel M.
Klump, Charles C.
Lambert, John A.
Masi, Walter C.
McCartney, Winfield S.
Murray, Bernard J.
Phillips, William F.
Stewart, Francis E.
Tiernan, Frank M.
Wells, Ebenezer M.
Wilkes, Arthur P.
Wooldridge, Napoleon.

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